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RINDERPEST.*

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As I am constantly being asked for information as to what should be done with the view of guarding against an attack of this disease and its suppression after it has broken out, I propose in a few notes upon the subject to state as simply and clearly as possible the position at the present time, and the precautions which owners of cattle can adopt.

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* CATTLE DISEASE.

Kandy, Feb. 23.

The Editor, Tropical Agriculturist, Colombo.

SIR,—With reference to the annexed copy of minute and resolution passed at a recent meeting of the Committee of the Planters' Association, I write to ask you whether the accompanying paper on Rinderpest would be acceptable to you for reproduction in the *Tropical Agriculturist*.—I am, sir, yours faithfully, A. PHILIP,

Secretary to the Planters' Association of Ceylon.

MINUTE AND RESOLUTION REFERRED TO.

Read letter from the Government Veterinary Surgeon, Colombo, transmitting his paper on Rinderpest and adding that he was leaving the island for South Africa, and that owners of cattle should report any case of Rinderpest to the Government Agent without delay who would inform the Veterinary Department; trained inoculators are kept in readiness and would be sent when required. Resolved:—"That the thanks of the Association conveyed to Mr. G. W. Sturgess, M.R.C., V.S. Government Veterinary Surgeon, Ceylon, be confirmed and that his paper be published."

[Dr. Sturgess's paper, which we now publish, will be of interest and value to all stockholders —European and Native.—ED. *T.A.*]

QUARANTINE.—The question of the subjection to quarantine of all cattle imported into this country I have recently raised, and it is under the consideration of Government. Apart from that, I would advise that all fresh cattle purchased should be kept apart from the remainder of the estate cattle for a clear week as a precaution not only against rinderpest but several other less serious diseases. A cadjan shed can without much cost be provided for this purpose whenever cattle are purchased. If after this period the cattle exhibit the usual signs of health and have a normal temperature they may be regarded as perfectly safe.

TEMPERATURE.—The average temperature of cattle in health is 102 F. As a maximum 103 F. and as a minimum 101F. may be taken. Any animal with a temperature over 103 F. should be regarded with suspicion. The temperature is taken at the rectum by means of a clinical thermometer.

RINDERPEST.—It is a highly contagious and infectious disease. It principally attacks cattle, but during a bad outbreak the smaller animals such as sheep, deer, goats may also be attacked, yet do not suffer so severely as cattle. It is communicated from one animal to another mainly by cohabitation; it may be carried short distances by the air. It may be spread by animal agency and by discharges from sick animals for long distances. The period of incubation is from five to ten days, and cattle recover or die in about the same time. The vitality of the virus in the nasal and other discharges is probably about a fortnight when exposed to the air, especially to the tropical sun; in buried carcasses it is probably several months.

SYMPTOMS.—There is elevation of temperature some days before the more marked symptoms appear, and animals may be ill and capable of communicating the disease before the more severe symptoms are exhibited. One of the earliest in many cases is puffing of the stomach resembling

ordinary indigestion. After a time the animal appears dull and dejected and loses its appetite. There may be twitching of the muscles of some part of the body. Usually at the outset there is constipation, soon followed by diarrhoea with blood in the discharges, which becomes worse as times goes on and has an offensive odour, the term "rice water diarrhoea being applied." Membranous casts resembling strings of flesh may be passed. The posterior bowel is intensely red and inflamed, and in the last stages protrudes from the anus.

There is a discharge from the eyes and nose which is irritant and often causes sores around the nostrils. The lining of the mouth becomes red and inflamed, and ulcers may be found inside the lips,* red patches may be seen inside the thighs of males and in females around the udder and vulva and inside the vagina. In the later stages the animal has a miserable appearance and may give low moans, emaciation goes on rapidly, the eyes sink and there is utter collapse and death.

PRECAUTIONS TO BE OBSERVED WHEN AN OUTBREAK OCCURS OR IS SUSPECTED.—When an animal falls ill in a herd exhibiting the symptoms of the disease it should be at once isolated in a shed as far away as possible from other cattle. As fever is one of the earliest symptoms, the temperatures of the remainder should be taken every day, and any showing high fever over 103 F. should be removed and isolated. In this way an animal can be picked out before it spreads the infection to its neighbours. It is as well to have two sheds, one for animals having a high temperature suspected to be developing the disease, and the other where those that develop the disease can be taken. Sacks soaked in creosote and water (½ teacupful to a bucket of water) or carbolic acid and water should be hung up in all the sheds for disinfection. The walls and floors should be sprinkled with the same solution or Jeye's fluid and water. The cattle should not be allowed to drink all from one vessel.

As an aid to prevention *all* the animals may be given ten drops of Jeye's fluid daily in their food. After three or four days' use it should be discontinued for a couple of days and then given again.

It is obvious that an owner should prevent his cattle coming into contact with other cattle as much as possible during an outbreak in a district and should not allow outside cattle to come on the estate, or cart manure from an infected village to the estate.

TREATMENT OF SICK ANIMALS.—Very little can be done in the way of treatment, but the following I have found most useful:—

Quinine	..	..	1 dram
Arrack	...	..	¼ bottle
Rice Congee ...		..	4 bottles
(Mixed.)			

To be given once or twice a day for a week or longer if necessary.

Ten drops of Jeye's fluid may also be given daily.

* They differ from the blisters of Foot-and-Mouth disease, being *cracks* in the skin, while the superficial layer of the skin is raised in the form of a blister in Foot-and-Mouth disease, and in the latter disease the feet are sore as well.

AS FOOD.—Rice congee, scalded bran, or bovinia and water. No hard food such as straw or grass should on any account be given until convalescence is well established, and then very gradually.

If there is violent diarrhoea a few doses of the following powder will be found beneficial:—

Prepared chalk	..	..	2 ounces
Powdered catechu	...	..	½ ounce
Powdered Gentian	..	...	1½ ounces
(Mixed.)			

To be given in a quart of congee.

INOCULATION.—When Rinderpest made its appearance in South Africa and became so widespread, scientific experts were got out to endeavour by experiment to find out a method of protective inoculation. After some time Professor Koch pointed out that the contents of the gall-bladder, the "bile" possessed protective properties when taken from an animal dead from rinderpest under certain conditions. This is the "*bile method.*" Later it was found that the blood of an animal that had recovered from the disease had protective properties in a mild degree. By injecting such an animal with gradually increasing doses of virulent rinderpest blood it was capable after a time of giving a blood serum of high protective value. This is the "*serum method*" and all the others are modifications of the two.

The bile method is simple and can be carried out without much difficulty. The material is always at hand whenever the disease breaks out. The serum method requires a properly equipped rinderpest station and laboratory in order to produce the serum.

The bile method affords protection for three or four months and repetition is necessary; the serum method also only gives temporary protection to healthy cattle, but it has been demonstrated that if cattle are inoculated with serum when developing the disease *as soon as* the temperature rises more or less permanent protection is given. A mild attack is contracted and a great many animals recover, but some losses occur.

The following are the details of the bile method which I published in 1898 (*vide* Ceylon Sessional Papers), and as far as I have gone with it—some one hundred cases—the results have been satisfactory. When properly and clearly carried out the cattle have not suffered any inconvenience and have returned to their work in about ten days.

THE BILE.—In a good percentage of fatal cases of rinderpest the bile will be found good for the purpose of inoculation. It should be dark-green in colour, perfectly fluid, free from shreds of the lining membrance of the gall-bladder, and from any odour of decomposition. A good number of instances occur where the bile is unfit for use, being yellow or dark-brown in colour, ropy in consistency, and containing shreds of the mucous lining of the gall-bladder. Such bile is poisonous and useless. The best bile is that obtained from an animal that has suffered severely from rinderpest for some days, or better if it has succumbed to the disease. It must be taken before decomposition of the body commences. In instances where it has been good I have noticed it was very abundant in most cases, a half to one pint being easily obtained.

METHOD OF TAKING THE BILE.—Great care must be taken in removing the bile in order t avoid contamination by blood, or contents of th

intestines, or by fluid of any kind in the abdominal cavity.

N.B.—The carcass should be placed on the left side and the abdominal cavity opened by cutting along the middle line from the breast-bone to the pubis and behind the last rib down to the backbone. An assistant can then raise the flap, and the liver and gall-bladder lying underneath the ribs are well exposed.

The gall-bladder should be slightly raised with the hand, and if dirty washed with a weak solution of bichloride of mercury (corrosive sublimate) in water (1 in 1,000 or 10 grains to the pint). An assistant holds a glass jar against it (taking care not to allow any blood or extraneous matter to enter), and it is then punctured with a sharp knife and the bile allowed to flow into the jar. A glass cover should be placed over the jar when the operation is finished. The hands, jar and instruments should be well washed and rinsed with the bichloride of mercury solution and dried. If several good samples of bile are obtained they should be mixed together and left for several hours before using. The bile should keep good for at least 24 hours if kept cool and in a covered vessel.

METHOD OF INOCULATION.—The animals should be cast and the legs tied. Ten cubic centimetres (about three drams) of bile is then gently injected under the loose skin in front of the chest (dewlap) by means of a 10 cubic centimetre hypodermic syringe and needle. As the needle of the syringe is withdrawn the skin should be pinched between the finger and thumb at the point of insertion, to prevent any of the bile coming out again and to close the wound. The part should be gently squeezed to insure distribution of the bile in the subcutaneous tissue. Protection is given in 10 days.

After inoculation cattle should not be worked for ten days. A swelling forms at the seat of inoculation and gradually subsides. There may be a little fever. The method is only of service when the cattle are free from the disease; if they have contracted it before inoculation it is of little service as protection is only afforded after *ten days* from date of inoculation.

Probably in some cases the bile may not contain the protective property to a sufficient degree, and some inoculated animals may develop the disease after inoculation and die, but this does not detract from the general usefulness of the method.

The disease in Ceylon is usually confined to areas and appears at intervals—sometimes long intervals—and as the "serum" method of inoculation on healthy cattle only confers temporary protection similarly to the "bile" unless applied when the animals are developing the disease, which would necessitate "salted" animals being kept at a high degrees of immunity so as to be capable of yielding the proper serum from their blood at once whenever the disease broke out. It takes several months to bring cattle to this stage by injecting increasing doses of virulent blood from an animal suffering from the disease. The preparation of the animals and serum could only be done at a properly isolated rinderpest station.

While favouring the permanent protection by serum, applied when the animals are past developing the disease (it is very plain to anyone I think how difficult it would be to apply this in this country). I think the bile method will answer our purpose combined with proper care in carrying out the simple rules of isolation and disinfection as applied to any contagious or infectious disease, at least until further investigation has perhaps shown a more useful and permanent method.

In South Africa evidence tends to show that it is possible for pure rinderpest bile to communicate the disease when injected into an animal.

Bile can be kept for some time by mixing it with glycerine, one part of glycerine to two parts of bile. It should be kept 48 hours before using.

This is quite safe (due to the action of the glycerine) and it is said to be of service as a curative applied to sick animals. From fifteen to thirty cubic centimetres can be injected either under the skin in front of the chest, or into the jugular vein when it exerts its action at once.

I do not advise indiscriminate inoculation. When disease breaks out in a district I would use *pure* bile amongst the *infected* herd, in doses of 10 c.c. (for very big animals 15 c.c. may be used), and for *clean* herds in the immediate vicinity an injection of 20 c.c. of *glycerinated bile*, and 10 days afterwards and injection of 10 c.c or 15 c.c, of *pure* bile taken from an animal that has died from rinderpest, which will confer a fairly strong protection.

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THE GEOGRAPHY OF TEA.

Having acquired, by travel in several of the principal places of production and in most of the important countries of consumption, a personal knowledge of the geographical distribution of the Tea plant in growth and of its product in consumption, I put together the results of my experience as a contribution, to the sum of commercial geography. This subject is not one of general importance to an International Congress, the areas of production and distribution being so comparatively limited, but it presents certain aspects of interest to the student of geography, and those I propose briefly to deal with.

It is doubtful if we ever shall be able to trace at what period in history an infusion made from the leaves of the Tea plant was first introduced as a beverage for domestic consumption, or how it was discovered that those leaves yielded a palatable drink when treated in the now familiar manner. Nor are we ever likely to know definitely when or how the regular cultivation of Tea shrubs was adopted in China as an agricultural industry, but it is probable that as our knowledge of China and its history increases, by reason of the developments now taking place there, we may gradually learn more of the past and we may possibly find authentic books dealing with the subject. At present we have little more than myth to go upon, and most of it is not worth treating seriously.

It is claimed that reference can be traced to the use of Tea in the writings of a Chinese author of about 2,700 B.C., but the earliest date that the article may be said to be of interest in connection with commercial geography is when it began to be exported. Even that period is difficult to fix, but during the 8th century A.D., it had become an article of taxable value, and probably soon after that the growing of it was commenced in Japan, although the cultivation of it there as an agricultural product does not seem to have begun till the 13th century.

The special points relative to the commercial geography of Tea, to which I wish to direct attention, may be grouped under three headings—

1. The principal localities of growth.
2. The principal areas of consumption.
3. The principal trade routes for transit.

(1) THE PRINCIPAL LOCALITIES OF GROWTH.

In the popular mind China still stands as the great producer, and, although reliable statistics of internal production and consumption are difficult to obtain, it is probable, having in view the immense population of that vast empire, and the very general use there of Tea, that the Chinese production is in respect to total quantity much the most important. But China is no longer regarded as the home of the Tea plant. Investigations have fairly and reasonably proved that Tea is indigenous to the valleyes of Upper Assam, and, proceeding upon the theory that a plant will thrive and develop best in what is its place of origin, the conclusion has been formed that the Tea plant of China is merely a debased variety of the indigenous Indian growth.

Probably Manipur was the birthplace of the Tea plant, as the variety of Tea known by the name of that native state has been the most successful and the most continually in favour with the planters. This state, lying just outside the tropics—an extensive valley with numerous hill ranges around it, densely clothed with jungle and large timber—seems to have developed those striking characteristics of the *Thea Assamica* which differentiate it so markedly from *Thea Sinensis*. In a climate where there is an abundant and fairly well regulated rainfall and a moist, steamy atmosphere with a cold, dry season to rest and ripen after growth, the Tea plant attained its highest development. Its existence in India and the native states bordering there-upon was unknown or at least unacknowledged till 1834; but as the Province of Assam was gradually explored and became developed by the constantly increasing Tea industry, there were found scattered through it and the adjacent districts many tracts of indigenous Tea. (*See Note at end.*)

Those considerations have given a fairly reasonable basis for the theory that the Tea plant made its way gradually eastwards along the lower slopes of the mountainous range lying just north of the Tropic of Cancer for some 30 degrees of longitude from the Brahmapootra Valley eastwards. At various points of the intervening distance can be found connecting links—say in Upper Burmah—until Tea is found in cultivation in Yunnan, the westernmost province of China. But the Tea, which in the jungles of Assam is often a tree 9 metres and upwards in height, has become merely a bush and so different in its general appearance that the botanists to whom the early discovered specimens of *Thea Assamica* were submitted may be pardoned for deciding that the latter was not Tea at all. The climate and soil of China, though suited to maintain life in the plant, do not induce the rank, quick, vigorous growth which an Indian plantation exhibits during fully half of each year, and in China the recovery of the bushes after plucking is much slower. The individual leaves are smaller and the flavour of the infusion made from these is so absolutely different from the other that even an untrained palate can recognise the contrast.

Minor differences however in that respect exist between the Teas grown in different districts of the same country, and even between plantations on opposite sides of the same valley or the same hill; situation, soil, elevation, climate and temporary climateic or weather conditions, all having a material influence upon both the appearance and the flavour of the manufactured article, and altering more or less its characteristics.

From Yunnan the cultivation of Tea doubtless spread eastwards and northwards, crossing ultimately from the mainland to the Island of Formosa and later to Japan.

Until well on in this century no effort appears to have been made to remove from Mongolian hands the monopoly of the Tea production, but when the Honourable East India Company lost in 1833 their monopoly of the China Tea Trade, the Directors set themselves to ascertain whether or not it was possible to secure for their own territories the supplying of a portion of what had become to them a very material business.

Vigorous but ill-advised efforts were made to introduce the cultivation of Tea into India, and seeds and plants of the debased China variety were imported. With those came Chinamen and Chinese methods of planting, cultivation and manufacture—much to the deteriment of the industry, the following 40 or 50 years being occupied in getting away from everything Chinese, and through the costly experience of mistaken and misdirected effort, the poor planter and investor acquired the excellent methods upon which the Indian Tea production is now worked —worked so excellently indeed as to have proctically destroyed the export trade for certain classes of the Tea produce of China. Clearances of jungle were made, including tracts of the indigenous Assam variety not then recognised, and the extensive province of Assam with its magnificent waterway was gradually opened up, the greater part of its area being carefully explored in the light of Tea possibilities with a thoroughness that might gratify any geographical society.

Following the success in Assam, Tea was planted in various parts of Bengal and other provinces of India, with more or less success until in 1897 the area was officially stated to be equal to 200,000 hectares. The greatest success has been along the line just north of the Tropic of Cancer, in the latitude where the principal part of the Chinese cultivation lay.

So far, reference has been made merely to Tea grown either in its natural habitat or in territories to which it may be said to have extended naturally, or by assistance, in a lateral direction.

But the two largest developments of production outside of India, China and Japan, have been on the Islands of Ceylon and Java,* both lying as to longitude in or near what might be termed the Tea belt, and about equidistant from the Equator, one to the north and the other to the south. In those the existence of high mountains, heavy rainfalls and climates forcing continuous growth have made the production of Tea commercially successful, although on lines materially differing from those followed in both China and India.

Other minor cultivations of Tea, have been attempted in Natal, Mauritius, the Straits Settlements, the Caucasus, Fiji, Johore, Brazil and many other places, including South Carolina, (U.S.A.), but none of them can be regarded as commercially successful on a Free Trade basis.†

(2) THE PRINCIPAL AREAS OF CONSUMPTION.

If it is a curious and interesting fact that almost the entire production for the world, of Tea, is raised within an area confined by 40 degrees of latitude and 60 degrees of logitude, it is equally curious that the consumption shows itself to have strictly geographical limitations. Outside of the domestic consumption of China and Japan, regarding with no reliable statistics can be obtained, the principal Tea drinkers are the people of Great Britain, Ireland, and of the British Colonies, the people of Russia and those of the United States of America.

Excluding the requirements of those Mongolian peoples, the world's consumption of Tea may be taken roughly at 230,000,000 kilogrammes of Tea per annum, a quantity which, including cost of transportation to the countries of consumption, but excluding revenue duties and distributive profits, may be valued at about £17,000,000. The huge volume of this will be better appriciated when it is stated that the large

* Java is far behind Ceylon in the production of tea.—ED. *T.A.*

† In the discussion upon the paper Captain Vasconcellos, Secretary of the Geographical Society of Lisbon, of the Portuguese Colonial Office, added to this list, the Azores, where, on the Island of San Miguel, Tea has been produced in sufficient quantity to allow of exporation to Portugal of an excess beyond local requirements.

passenger liner, the "Kaiser Wilhelm der Grosse," would have her cargo space entirely filled 232 times over were she engaged transporting it. To put it another way, the quantity of dry Tea leaves is sufficient to make an infusion of 28,000,000,000 litres of liquid Tea, or 100,000,000,000 ordinary tea-cups, being one for each day of the year for every five persons of the present estimated population of the entire world.

The Southern Hemisphere ranks lightly in the matter of population, and its Tea consumers live south of the topic of Capricorn in South Africa and Anstralia; bnt if they are few relatively they consume heavily, the average consnmption per head in Australia being nearly 4 kilogrammes per annum.

In the Northern Hemisphere (again excluding the races who consume their own produce) the material consumption of Tea is in regions lying 40 degrees north and above it, but here there is an interesting sub-divison to be made. In the United States and Canada, in some postions of Europe and of Asia, and along the north of Africa there is a free use made of green or unfermentrd Teas with pale pungent infusions. The demand for such, as a general rule, lies principally in lower latitudes, while the further north the consumer lives he seems to require more of the black or fermented Tea of India, Ceylon or China, with the dark, thick, heavy liquor its infusion produces.

Great Britain and Ireland take much the largest total of imports, the quantity in 1898 being 107,000,000 kilogrammes, but per head this only amounts to 2·65 kilogrammes per annum of the population, or a good deal less than is taken by the British Colonies in Australasia.

Next to Great Britain comes Russia as a consumer of 42,000,000 kilogrammes, but that only represents about ·34 kilogramme for each of the population, the poverty and not the will of the people probably accountiug for the small figure, as they are really great users of Tea, but take it exceedingly weak, and draw the spent leaves until no colouring matter is left in them.

The United States is a large consumer in point of total—31,000,000 kilogrammes, bnt this is only ·41 kilogramme per annum for each of the population, although she United States people are great coffee drinkers, taking 5 kilogrammes per head per annum of coffee. Besides, the population is of such a composite character that it includes many people not by descent Tea drinkers.

Except Canada, which follows the customs of its mother country and sister colonies by consuming about 2 kilogrammes per head per annum, and Holland, which takes roughly ½ kilogramme per head there is no other country whose consumption, either in total or per head calls for special notice.

(3) THE PRINCIPAL TRADE ROUTES FOR TRANSIT is perhaps for geographers the most interesting section of this subject.

In the absence of authentic knowledge as to the early history of Tea cultivation, and of the origin and extension of the tea-drinking habit, we may take it there was little or no foreign trade in the article until the Dutch carried small quantities of it to Europe.

Probably some left the North of China in caravans as it does to this day, and there may have been some trade done with Mongolia and possibly Siberia, but there is no record of it ever having been brought to Wisby in Gothland, the great mart for Oriental produce during the 11th and 12th centuries. There is also no reference made to Tea commerce or to Tea drinking in the travels of Marco Polo, so he probably either did not observe the habit, or if he did it did not strike him as worthy of notice.

Starting with the introduction above referred to in the 16th century, the use of Tea in England made slow progress, but a public Teahouse was opened in London in 1657, and in 1678 the import to the Honourable East India Company was 2,138 kilogrammes.

A century later it reached 2,600,000 kilogrammes per annum, and early in this century the figure was 10¾ millions, but that represented the supply of many countries besides England, as London was then, and until recently, the common warehouse and markad for the world, and England the common carrier.

Throughout the century, fairly steady and rapid progress has been shown—especially in its earlier periods—in the trade from China, which reached its maximum in 1879. And it is here that some of the romance of commerce comes in.

As the trade grew in importance, the advantages of rapid transit for the Tea of New Season's production began to be appreciated, and the slow and stately progress of the old East Indiaman grew out of date. A type of vessel specially designed for the rapid carrying of Tea from China to Englaud *via* the Cape of Good Hope, was introduced, known as the "China Clipper," and the competition was always keen as to which ship should make the most rapid passage. This culminated in the year 1866, when nine ships sailed almost simultaneously from Foochow, three of them crossing the bar in compauy. Those three were all built by the same builders in Greenock, and came in ahead of all the others, making the long voyage of fully 16,000 miles in 99 days. They each docked in a separated dock in London upon the same day, and all within two hours of each other. The two leading ships had not seen each other for 70 days and met off the lizard, from which point they ran a neck and neck race before a strong westerly wind, with every rag of canvas set.

The opening of the Suez Canal in 1869 soon changed the course of all trade with the East, and in a few years the seuding of Tea per sailing ship round the Cape of Good Hope, was a thing of the past. Romance was no more, although there was extreme competition in building steamers with great power and speed to land their cargoes rapidly by the new route. This culminated in 1882, when the S.S. "Stirling Castle" made the phenomenal run for those times, of 28 days from Woosnng to London.

But England, which formerly supplied almost everything to her own colonies and to many foreign countries besides, has under the modified conditions of abundant steam tonnage everywhere, become less and less of a distributive country. Consequently, direct shipments are made now from the countries of production to those of consumption. America gets its Tea largely through its western sea-board from China, Japan, Ceylon and India, while not a little is reaching it of recent years by steamers running direct from those countries *via* the Suez Canal to New York. The Australian demand is fed by steamers from Chinese ports, from Calcutta and Colombo.

The extensive Russian trade is still done in its major part by overland transit, by caravan and partly by river and railroad, and this, next to the transit to London, represents much the largest volume of Tea traffic passing in one channel. For the purpose of tbis trade, the greater portion of the Tea supply is compressed into what is termed Brick Tea, the Bricks being flat tablets weighing abont one kilogramme each. The supplies are packed and prepared at various Tea ports in China, and concentrated at Tientsin, from where they are despatched. An enormous traffic with Siberia takes place in these, and the baskets into which they are made up are sent by camel caravans out of the Kalgan Gate of the Great Wall through Manchuria or Mongolia to Kiakhta, and thence distributed through Siberia. In some cases the shipments are made by sea to Nikolaevsk, and thence by water up the Amur River.

One of the most interesting developments of modern trade—in which Tea is an important factor—is the opening up of traffic through the Kara Sea into the Obi and Yenisei Rivers, with which the name of Captain Wiggins has been associated. By this route for several years past considerable quantities of Brick Tea have been conveyed entirely by water from Chinese ports with transhipment in London to steamers proceeding up the Gulf of Obi to Tiumen

for sale at the fair which is held annually in February at Irbit. This Journey, although about 7 times as long in point of mileage as the old direct caravan route, can be done in about 4 months as against eighteen by the other way, and it is of course much less expensive. The partial opening of the Siberian Railway has affected the trade route, and when there is through transit across Siberia from Vladivostock and possibly Port Arthur to Europe, the Russian Tea trade will probably be subjected to further re-arrangement of routes.

Another recent development in connection with the Russian Tea trade has been that of the great Russian Volunteer Fleet in calling at Chinese ports and Ceylon, and carrying from them large quantities of Tea to Odessa for distribution to Moscow, Nijni Novgorod, and other points.

Other most interesting trade routes are those for the supply of Persia, Turkestan and Afghanistan, partly through the Persian Gulf on to Meshed, and partly through the Black Sea to Trebizond and Tabreez.

Note.—In the discussion following the paper, Professor Andreas Krassnow, from Kharkoff (Russia), expressed the opinion that the Tea plant must be indigenous, not to Assam only, but to the whole monsoon region of Eastern Asia, where it grows wild as far north as the islands of Southern Japan. Dr. Krassnow collected in many parts af the island of Shikoku in Japan, and in the environs of the town of Kochi, wild growing plants. They occur in the dense forests on the slopes of mountains, which have never been cultivated in the province of Japan, and are even now not thickly populated. Like the English in Assam, the Japanese are cutting down and felling the forests, but they are leaving the Tea plants to grow in the form of plantations of wild Tea, from the leaves of which they produce different kinds of Tea of inferior quality. Not only common Japanese Green Tea is prepared, but two or three inferior sorts, whose qualities resemble much the material from which the Chinese make their Brick Tea.

The wild tea grows to a height from 3 to 5 feet, and the flowers are a little smaller than those of the cultivated form, but the leaves are not re-curved on the edges. In some forests the plant is very numerous, in others it occurs more rarely, and is found amongst other evergreen shrubs, growing in the shadow of *Quercus glabra*, and similar trees, which largely make up the evergreen forests of Southern Japan.

Dr. Krassnow believes that the Tea plant existed in China and Japan long before it was introduced in cultivated form, and that the peculiar properties of the China plant were produced, not by cultivation in a colder climate or on exhausted soil, but by the changes of climate which have taken place in Eastern Asia since the Tertiary Epoch. The period of cultivation of tea has been too short to produce the differences which exist between the Chinese and Assam plants, and many botanists consider them to be different species. It is well known that the Assam plant is frozen by temperatures which the China plant bears very well, and that the hybrids which are cultivated in hot climates, approach more to the Indian, and those in colder climates to the Chinese plant. The hybrids suffer from the cold winters in Batoum, which the Chinese plants never do. On the other hand, China plants cultivated in hot climates never become so tall and never have such large leaves as the Indian. All these facts are stated by Professor Krassnow with more details in his book "On the Tea-producing Districts of Asia," bringing out the conclusion that the Tea plant since the remotest times formed two varieties—Assam and Chinese—the first growing wild in India, and the other occuring still wild in Southern Japan (and perhaps in Formosa) where they were discovered by aborigines *after the introduction of the cultivated form from the south-west.*

PLANTING COFFEE, BANANAS AND ORANGES.

I send a diagram showing how I am planting out ten acres of Coffee, Bananas and Oranges. If I am on the wrong tract I want those who have a better way to show wherin I am wrong. The way to make this "Journal" more interesting is for those who engaged in Agriculture to write up what they are doing, and how they are doing it, and what success they are having. "In the multitude of consellors there is safety," you will find in Proverbs. So come on a "multitude" of you and let us help the Editors all we can. I am planting coffee six feet apart, bananas 12 feet, and oranges 24 feet. I have two men measuring and staking coffee for which I pay sixpence per 100, or six shillings per acre. Coffee at six feet square will take just 1,210 plants per acre. I have the coffee pits dug, and coffee planted by the day—as I do not care to have this part of the work rushed or carelessly done. But I do not feel satisfied unless I can get 300 holes dug and that number of coffee plants put in for a shilling. Planters know of course that coffee just now is very low in the markets of the world, and one must therefore have more work done for the same pay. The bananas I am planting at two shillings per 100. The labourer digs 100 holes, he then gets 100 good large roots cut off the stalk close to the roots, and leaves the root-stump near the hole. My head man then inspects both the holes and roots, and if satisfactory he tells the men to go ahead and cover up. So I am planting bananas at less than a farthing a hill. Now comes my orange plants, sour stock, one year old from a nursery where they were planted one foot apart. The ground before planting the seed was dug—or forked 15 inches deep, and from this I got as fine plants as any one could wish. These I am planting out 24 feet apart. The following diagram will explain, the o is coffee, x bananas, and *oranges. As the orange trees grow and shade the coffee it is my intention to cut out the banana trees, slice them up aud dig them into the soil.

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o   o   o   o   o   o   o   o   o   o   o   o   o
  x       x       x       x       x       x
o   o   o   o   o   o   o   o   o   o   o   o   o
*               *               *               *

o   o   o   o   o   o   o   o   o   o   o   o   o
  x       x       x       x       x       x
o   o   o   o   o   o   o   o   o   o   o   o   o
o   o   o   o   o   o   o   o   o   o   o   o   o
  x       x       x       x       x       x
o   o   o   o   o   o   o   o   o   o   o   o   o
*               *               *               *

o   o   o   o   o   o   o   o   o   o   o   o   o
  x       x       x       x       x       x
o   o   o   o   o   o   o   o   o   o   o   o   o
o   o   o   o   o   o   o   o   o   o   o   o   o
  x       x       x       x       x       x
o   o   o   o   o   o   o   o   o   o   o   o   o
*               *               *               *

o   o   o   o   o   o   o   o   o   o   o   o   o
  x       x       x       x       x       x
o   o   o   o   o   o   o   o   o   o   o   o   o
o   o   o   o   o   o   o   o   o   o   o   o   o
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It will be seen above that bananas are planted between every other row of coffee—each square of four coffee plants having a banana tree for shade—and at every fourth coffee tree there is an orange tree in the line. I have decided on this way of planting after a great amount of planing and figuring. If any of our readers have a better way by all means let us have it in the next "Journal." Many will say wat's the use of bothering with coffee now, it is so cheap. In reply I will say that I have seen coffee just where it is now three times since 1861, and between times I have sold at 136s. per cwt. Take my advice, plant Coffee, Bananas and Oranges, *but plant coffee plants*, not suple jack coffee

suckers. Plant good thick stout banana roots, and orange plants grown in a nursery, not miserable things yanked out of cow pastures.—*Journal of the Jamaica Agricultural Society.*

Williamsfield. J. DOIDGE.

PRESERVATION OF STABLE MANURE.

(Continued from page 516.)

"Equal weights of horse and cow manure, 4 ton of each, were intimately mixed. A sample of this mixed manure was taken and analysed. This gave the composition of the manure at the beginning of the experiment. Then the 8 tons were divided into two equal parts, and 4 tons were placed in a small building that was weather-proof, and compressed by pounding; the other 4 tons were placed in an open bin. In this bin the manure was exposed to every rain that fell, but the sides and floors being constructed of double boarding, all due precaution against the leaching was taken. From month to month, for a whole year, both these manures were weighed and sampled. The samples were then submitted to careful analysis, and from the figures obtained the losses which might have occurred were calculated, both in the 'protected' and 'exposed' manures. From these figures it is possible to say whether the plant-food in either of the manures had become more available. The following chart will show clearly the results arrived at:—

WEIGHTS OF FERTILISING CONSTITUENTS IN "PROTECTED" AND "EXPOSED" MANURES.

	Fresh.		At the end of 3 months.		At the end of 6 months.		At the end of 9 months.		At the end of 12 months.	
	Protected.	Exposed.	Protected.	Exposed.	Protected.	Exposed.	Protected.	Exposed.	Protected.	Exposed.
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
Weight of manure ..	8,000	8,000	2,980	3,903	2,308	4,121	2,224	4,189	2,185	3,838
Organic matter ..	1,938	1,938	880	791	803	652	760	648	770	607
Total nitrogen ..	48	48	40	34	39	33	37	29	37	31
*Total phosphoric acid ..	25	25	25	23	26	22	25	21	21	21
†Available phosphoric acid	15	15	20	15	19	15	21	17	19	16
*Total potash ..	62	62	65	48	59	44	60	41	60	40
†Available potash ..	54	54	62	45	52	42	56	38	55	35

* Soluble in strong hydrochloric acid. † Soluble in dilute citric acid.

Further, in addition to determining the total amounts of those elements enumerated, the amounts of such as were converted into compounds more available plant absorption, were estimated month by month. This is an important matter, as these constituents are of practically but little value to crops until they have been so converted.

Mr. Shutt adds:—"In considering the charts, I wish, first, to call attention to the richness of the fresh manure as produced on the Experimental Farm, Ottawa, compared with manures ordinarily found in the barnyards throughout the country.

	Average on Farms	C. E. F.
	lb. per ton.	lb. per ton.
Nitrogen	7·8	12·0
Phosphoric Acid	3·6	6·1
Potash	9 0	15·3

"You will notice that there is a very great difference in favour of the C. E. F, manure. I attribute it chiefly to the greater care of the liquid manure on the Experimental Farm. We know that the liquid manure is by far the richer in nitrogen and potash, and I cannot impress upon you too strongly the desirability of using sufficient absorbent litter to hold all the urine. This is a matter in which tons of most valuable plant-food are annually lost by farmers.

"By referring to chart No. 1, you will notice there was a continuous loss in weight, both in the 'protected' and 'exposed' manures, throughout the period of the experiment. This loss was largely due to the destruction of the organic matter by fermentation. This is made clear by comparing the amounts of organic matter present, month by month. During the first three months the "pretected' manure lost 1,058 lb., and the 'exposed' manure 1,147 lb. organic matter. At the end of the year the organic matter in the former had been reduced to 770 lb., in the latter to 607 lb.

"Secondly, there is a similar (though not so great) loss of nitrogen. From 48 lb. in the 'protected' the nitrogen was roduced to 40 lb. in three months; in the 'exposed' the nitrogen fell from 48 lb. to 34 lb. in the same period. Again we notice, then, the greater loss in the manure fermented without protection.

"Thirdly, as regards phosphoric acid, it is to be observed that practically there is no loss in the protected manure; in the exposed manure 4 lb. of the 25 lb. originally present were lost by drainage.

"Considering the effect of fermentation upon the availability of the phosphoric acid it will be seen that in the protected manure the amount of such available phosphoric acid increased. This I deem a matter of considerable moment.

"Fourthly, in speaking of potash we have again to record the fact that practically there was no loss in the protected manure. The case, however, is very different in the exposed manure. Although precautions were taken against undue leaching, by providing the bin with double flooring, yet nevertheless there was a great loss of this element by soakage. It must be remembered that the potash of manure exists for the greater part in the urine, and consequently is present in solution. This exposed manure lost 22 lb. out of 62 lb. originally present—more than one-third. It seems to me that from a consideration of this experiment we may conclude that there will always be some loss on keeping manure unless it is preserved on a cement floor. In thinking over these results I would like every farmer to ask himself if the conditions under which he rots manure are as go d as those of the exposed bin of this experiment. If uot, his loss of potash will be greater than that we sustained.

"In the following chart we have given the percentages of the fertilising constituents lost under the two systems of rotting, and also stated the loss

in valu e per ton that these manures sustained. This table i s a most instructive one, and worthy of careful study.

LOSS OF FERTILISING CONSTITUENTS IN THE ROTTING OF MANURE.

	At end of 3 months.		At end of 6 months.		At end of 9 months.		At end of 12 months.	
	Protected.	Exposed.	Protected.	Exposed.	Protected.	Exposed.	Protected.	Exposed.
	p. c.	p c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.
Loss of organic matter ..	55	60	58	65	60	67	60	69
" Nitrogen ...	17	29	19	30	23	40	23	40
" Phosphoric acid ..	none	8	none	12	none	16	4	16
" Potash	none	22	3	29	3	31	3	36
Loss in value per ton of original manure.	20c.	64c.	27c.	80c.	36c.	90c.	36c.	95c.

Value of fresh manure, \$2·61 (10s. 10½d.) per ton.

CONCLUSIONS.

1. Fermentation causes loss. In both instances there was loss by destruction of organic matter and nitrogen, though the loss of these constituents was much greater in the exposed than in the protected manure. By rotting we must allow that the organic matter is converted into compounds that more readily form humus in the soil, and this is certrinly an advantage. It is an offset against the loss we have mentioned.

2. There was no loss of phosphoric acid in the protected manure, but the exposed manure suffered loss in this element. Rotting had a useful effect in rendering the phosphoric acid more available.

3. Though practically no potash was lost from the protected manure, more than one-third the amount of this value element was lost by drainage in the exposed manure.

4. Rotting does not affect the availability of the potash; in other words, the potash of fresh manure is just as valuable as plant-food as that in rotted manure.

5 There appears to be no object in rotting manure for a longer period than three months.

6. The best conditions for rotting necessitate (1) protection from rain, sun, and wind, (2) a water-tight cement floor, and (3) that the mass of manure be kept moist and compact.

7. Weight for weight, well rotted manure is much richer in plant-food than fresh manure.

8. Rotting manure destroys weed-seeds that may be present.

In answer to a question as to whether it would not be better for the farmer to use manure in the green state, unless he has foul seed in it, and he should then ferment it to destroy the seed, Mr. Shutt said:—"Not necessarily. For certain crops and certain soils it is better to have rotted manure, though it may not be possible to rot the manure without some loss; but if he is not prepared to have such arrangements whereby the manure is protected and preserved from leaching, and if he is not prepared to keep the manure moist and compact, then it is better for him to get that manure into the ground as soon as possible. It seems to be the opinion of most practical men that heavy clay loams are those which benefit most by fresh manure. There is no doubt that the soil is a storehouse which prevents loss of the fertilising material of the manure. Clay loams are very much improved in their mechanical condition by the application of fresh manure. On the other hand, for light and sandy soils, rotted manures are probably the best. In working light and leachy soils it seems to be the greater economy to feed the crop rather than to try to improve the soil; in other words, to apply the manure annually in the rotted condition. For such soils there is nothing better than leguminous crop turned under. This is the cheapest way of permanently improving such soils."—*Agricultural Gazette.*

BORDEAUX MIXTURE FOR PEACH FRECKLE.

A correspondent writes, that in his experiments with Bordeaux mixture (very carefully prepared) for peach freckle, the fruit and leaves of some of the trees were destroyed.

The fruit expert, Mr. Allen, reports that in using Bordeaux mixture on tender foliage, unless the climatic conditions are absolutely favourable, it is well to always be on the safe side and dilute the 40 gallon mixture up to 45 or even 50 gallons of water.

Mr. Allen also wishes fruit-growers intending to fumigate while trees are making new growth to note that not more cyanide than 1 oz. to 200 cubic feet ten-space should be used.—*Agricultural Gazette.*

BANANA FOOD FOR INVALIDS.—After a long experience with typhoid patients, Dr. Ussery, of St. Lois, maintains that the best food for them is the banana. He explains by stating that in this disease the living membrane of the small intestines becomes intensely inflamed and engorged, eventually beginning to slough away in spots, leaving well-defined ulcers, at which places the intestinal walls become dangerously thin. Now, a solid food, if taken into the stomach, is likely to produce perforation of the intestines, dire results naturally following; and this being the case, solid foods, or those containing a large amount of innutritious substances, are to be avoided as dangerous. But this banana, though it may be classed as a solid food, containing as it does some ninety-five per cent. nutrition, does not possess sufficient waste to irritate the sore spots; nearly the whole amount taken into the stomach is absorbed, giving the patient more strength than can be obtained from other food.—*Journal of the Jamaica Agricultural Society.*

NETTLE FIBRE IN GERMANY.—Nettle fibre has of late come greatly into favour in the manufacture of fine yarns and tissues in Germany. In that country, according to the United States Consul at Glauchau, there are factories which use these fibres, both in spinning and also for ulterior purposes. In nettle spinning alone, over 10,000 spindles and some hundred workmen are employed. The raw material is imported almost exclusively from China, whence from 660,000 to 800,000 lbs. are annually sent to Germany. Nettle fibre produces one of the finest tissues obtainable from any known kind of vegetable fibre. In view of the importance with this seems likely to attain in connection with the weaving industries, it is intended to introduce the cultivation of nettles, if possible, into the Cameroons. The idea is to prepare the products of this experimental culture at the place where they are obtained, and test them in German factories. Should favourable results follow from these experiments, it is intended to organise nettle-growing enterprises on an extensive scale.—*Journal of the Society of Arts.*

COOLY IMMIGRATION FROM THE INDIAN FAMINE DISTRICTS.

HERE is an answer to our enquiry as to coolies from the famine districts, written by the Rev. H. G. de St. Dalmas who has had long experience as Missionary in Central India and also knows Ceylon well :—"Yours of 1st February has reached me here (Poona) today—only five days from Colombo ! Some of the famine people would certainly be glad to go to Ceylon and some are actually going to Assam (Sylhet) and tea planters come to Rutlam to select coolies. Many were disappointed at not being passed by the doctor. I wrote to the Rutlam Missionary, the Rev. J. Fraser Campbell, D.D., Canadian Mission, Rutlam, C.I., to invite the planter to come to Sehore, but I got no reply—this was only a few days before we left Sehore. I have also heard that Government is sending Marwaris back to their own country, Jodhpur, Rajputana, and that 1,600 were sent away from Indore.

"There has been a great emigration and some, who are ready to perish, would be glad to go anywhere. Some well organized effort by Government or by a Syndicate might succeed in getting some hundreds of familie to emigrate. I doubt if this could be success fully accomplished without the presence of an agent from Ceylon who had time and money to go about to the various centres and collect suitable families and arrange for their transport. If such an agent were known to be coming, the Missionaries in Central India could get lists of volunteers from whom suitable ones could be selected. At Sehore we have relieved thousands, helping many to go to the other Provinces to look for work, and I think the most successful hunting ground might be the relief works in the Central Provinces. The new Chief Commissioner, A. H. L. Fraser, Esq., C.S.I., Nagpur, is a good Christian man (son of old Dr. Fraser, formerly of Poona.) If a large number could be taken, how would it be to write to Mr. Fraser, the C.C., and get Government help to hunt up coolies and families at the chief relief centres in the C.P. ? My successor at Sehore, Mr. A. Taylor I fear could not help much, but would get lists prepared—if the Marwaris, &c., are not in the meantime sent away. Mr. Fraser Campbell, editor *Gyan Patrika*, Rutlam, C.I., could put a para in his paper about coolies for Ceylon and Mr. Evans, now at Dhar, C.I., care of the Rev. F H Russell (his son-in-law) has been writing about these famine wanderers in Central India and might take an interest in the scheme."

Mr. St. Dalmas himself is about to leave for England. His information ought to be useful to Government and the new Railway Contractors and later on, perhaps to Sugar growers here.

TEA LAND IN JAVA.

An advertisement in the *Ceylon Observer* shows that two fine blocks of land, suited for tea, are for sale in Java at what seems not too high a rate. We do not like in Ceylon to hear of more tea being planted ; but the redeeming features in this case are found in the fact that there is a large local demand for Java tea, and that the exports are more and more taking the place of coffee in Holland and Western Germany,

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CASTLEREAGH TEA COMPANY OF CEYLON, LIMITED.

ANNUAL REPORT.

The Directors submit herewith the balance sheet and profit and loss account for the year ending 31st December, 1899, duly audited.

The balance of profit (including R2,407·89 brought forward, and after providing for depreciation of buildings and machinery as shown in the accounts) is R31,157·25. Of this sum R9,600 has been absorbed in paying an interim dividend at the rate of 4 per cent. The directors propose, after placing R718·73 to reserve fund, being 2½ per cent. on the profits, as resolved on in general meeting, to declare a further dividend at the rate of 8 per cent. payable on the 13th February, absorbing R19,200 and after paying a bonus of 5 per cent. on the profits divided, including reserve fund, for the year to the superintendent, in terms of a promise made to him, absorbing R1,475·93 to carry forward to 1900 account R162·59.

The total tea crop was 175,755 lb. against the estimate of 195,000 lb., the season having been unfavourable, in the earlier months. The cost of the tea delivered to buyers was 24·82 cents per lb., or 22·82 cents exclusive of provision for depreciation on buildings and machinery. The tea was sold locally, realising 42·51 cents per lb, leaving balance of gain 17·69 cents. Cost in 1898 was 24.68 cents, and value 39 cents per lb.

The Company's Property consists of :—

476 acres tea under leaf. Yield in 1899=369lb, tea per aere.
4 ,, planted in 1897.
4 ,, ,, 1898.
42 ,, forest.

Total..526 acres.

The estimated crop for 1900 is 185,000 lb. tea, or 389 lb. per acre.

It will be seen that the property representing capital stands in the balance sheet at approximately R495 per acre cultivated, and that the profit per acre is over R60 as compared with R39 in 1898 and R28 in 1897, the profit upon capital being R11·97 per cent, or including the sum reserved against depreciation R13·44 per cent.

Mr. J H Starey retires from the Board.

The shareholders will be requested to elect a director and also an auditor for the current year.

THE KELANI VALLEY PLANTERS' ASSOCIATION.

FIFTEENTH ANNUAL REPORT OF THE ASSOCIATION.

Your Committee have pleasure in submitting their 15th Annual Report.

MEETINGS.—Five Committee and four General Meetings have been held during the year.

FINANCE.—The balance in hand is R567·80 against R600·75 at credit last year.

SCHEDULE.—The schedules of the Association shows 78 estates, one private and one honorary member, against 76 estates, one private and one honorary member last year, two new estates having joined the Association during the year.

CROP.—The estimate for 1900 is 15,303,800 lb. The acreage, of tea in bearing is 31,228 acres; there are 4,691 acres not in bearing total 35,919 acres, the average yield per acre is 490 lb. The large increase over last year both in acreage and crop, is accounted for by the more accurate collection of returns.

TEA PRICES.—The price of low-country teas has, your Committee is glad to note, been very satisfactory during the year, being from ½d to ¾d better than in 1898, the prices during the first six months were especially good. In August after the conclusion of the 1 lb. draft dispute the average price of Ceylon tea fell to the lowest point, and since then, though there has been a recovery, prices have been much below the corresponding rates of last year. Your Committee regret to note that the concession as to

the taring of packages on which the draft dispute was settled, has not yet been introduced, owing to the objection of some of the importers to clause G of the new regulations. There seems at present no prospect of a settlement being arrived at, and if this concession be lost, the draft dispute with its resultant disorganization of prices will have been fruitless.

KELANI VALLEY RAILWAY.

Your Committee regret that they cannot as yet report that the construction of the line has been begun. The Engineer in charge has been engaged during the year, in surveying portions of the line, according to the recommendations of the Consulting Engineers. The survey was finished in August, and the report is now, we believe, under consideration by the latter. The survey of the private lands required for the construction of the line is now proceeding; this and the proceedings in connection with the purchase of the lands will take some time. On the whole, your Committee cannot but feel disappointed with the slow progress made in commencing this railway, which has been an urgent want of the district for many years. H. E. the Governor visited the district in January and fully explained the reasons for the delay, and your Committee feel assured that the work will now be pushed on with all despatch. Your Committee regret that Mr. Mackintosh, the late Chief Resident Engineer of Railway Extension, was obliged to resign his post owing to ill-health, and wish to record their thanks to him for his services in connection with the survey of the railway. Mr. Oliver has been appointed in his place, and your Committee have every confidence in this appointment, Mr. Oliver having already had many years experience in railway construction in the island. Your Committee take this opportunity of offering the Hon. W W Mitchell a hearty vote of thanks for the able and painstaking way in which he has always advocated the construction of the railway and learn with much regret of his of retirement from the Legislative Council of Ceylon.

MEDICAL.—The health of the coolies has been fair during the year. The extension of the Avisawella hospital was sanctioned in December, 1898; the first step in connection with the purchase of the necessary land were taken in June last and the land has since been acquired, and the foundations of the new wards are now being cut. Your Committee regret the long delay in connection with this most necessary work, as the accommodation at this hospital is, and has been for some years totally inadequate to the needs of the district served by it. During the year the hospital visitor drew your attention to the insufficient supply of clothing and nursing attendance in this hospital. The matter was brought to the notice of the P.C.M.O., and is now the subject of correspondence. Your Committee hope that the deficiencies pointed out, will be rectified. In this connection, your Committee would draw your attention to the unwarranted attack made, in his report for 1898, by Mr. Arunachalam, the Registrar-General, on the lowcountry planter. After quoting figures to show that, while the ratio of mortality amongst labourers on upcountry estates is less than that amongst the upcountry Sinhalese, on the other hand, the ratio of mortality amongst the labourers on lowcountry estates, greatly exceeds that of the lowcountry Sinhalese. Mr. Arunachalam proceeds as follows:—"The conclusion seems to be almost irresistible that in the newly developed estates of the lowcountry districts, the labourers' health is not looked after by his employer in the same manner as in the upcountry districts with their long traditions of excellent relations between employer and employed, and that it is necessary to resume the system of Government medical supervision abandoned some years ago."

While Mr. Arunachalam is, no doubt, an eminent authority on statistics, he cannot be said to be an authority on medical or sanitary matters, and an attack from such a quarter might well be passed over in silence. Nevertheless your Committee think it best to put the following reply on record. The question of hospital accommodation and medical attendance is one which has occupied attention at almost every meeting of the Association since in foundation, and we have continually kept before Government the necessity for extending hospital accommodation in accordance with the increase of the acreage in cultivation and of the estate population. In addition to this, the majority of estates have established at a considerable cost to private dispensaries (for which the Government supply medicines free) for the early treatment of disease. While your Committee regret the large ratio of mortality, they are convinced that there is no such evasion of duties as is imputed, but that the causes thereof lie beyond your control. Malarial fever and the diseases connected therewith are the principal source of illness amongst the low country estate population. As is well-known, these diseases are always prevalent in low-country districts such as the Kelani Valley, and until medical science is more advanced it will not be possible to control them.

TELEGRAPHS.—During the year, the telegraph wire has been extended to Ruanwella. Your Committee regret to have to report that the Post-master General still refuses to open a Telegraph Office at Dehiowita, though the wire passes the door of the Post Office Your Committee hope that the P M G will see his way to concede this small boon at an early date.

ROADS.—The state of the roads in the district has again been a source of much trouble and complaint. The Planting Member, at your request endeavoured to obtain a larger vote for upkeep during the year but without success. The vote for upkeep being indeed reduced. The dry weather during the last six months has been against repairs being executed, but the roads will never be in a satisfactory state until a large amount has been spent in putting them into thorough repair, the present vote being quite insufficient for that purpose. In this connection, your Committee would impress upon the Director of Public Works the vital importance of keeping the district communications in a thorough state of repair, until the completion of the Railway. Your Committee regret very much that the Government has not decided to construct a bridge over the Algoda River, so as to bring the Panawala Korale in direct road communication with the Railway station at Dehiowita. They regard the construction of a causeway, with approaches at a gradient of 1 in 14, as altogether unsound. Moreover, they think it is an engineering mistake and will be liable to be washed away in heavy floods.

A causeway was built on the Ritigaha Oya River some years ago, but a bridge had later to be substituted as the causeway was found unsuitable.

LABOUR.—The supply has been fair during the year but your Committee regret to note that the number of emigrant coolies has largely exceeded the number of immigrants during the past 12 months. The construction of the railways now sanctioned, will require the services of some thousands of coolies. The subject of recruiting this labour has been before the Parent Association, who appointed a sub-committee to consider the matter. This Sub-Committee has drafted a report containing suggestions and recommendations, which has been forwarded to Government.

The Government have practically agreed to recruit labour required in India, and to appoint a Commission to consider the question. Your Committee have read with lively satisfaction the speech of the Colonial Secretary in Council, on this subject.

K. V. LABOUR FEDERATION.—The K. V. Labour Federation has continued to work satisfactorily during the year. In August the Dolosbagie and Yakdessa Association affiliated itself with the K. V. Labour Federation, and a scheme has been adopted for the settlement of disputes between the members of each district.

BLIGHTS have attracted considerable attention during the year, throughout the Planting districts,

but your Committee are glad to report that the Kelani Valley is fairly free from them.

Mr. Kelway Bamber; Government Mycologist, &c. Your Committee await with eagerness Mr. Kelway Bamber's Report on the cultivation and manufacture of tea. They are glad to note the appointment of Mr. Carruthers as Government Mycologist in addition to the appointment of Mr. E E Green as Government Entomologist, and they hail with approval this inauguration of an Agricultural Department, which has been too long delayed.

Coach Services.—Numerous complaints as to the state of the coaches, and the cruelty practised on the horses have again been received during the year. The matter was brought to the notice of the Colonial Secretary, who has replied that complaints should be forwarded to the Government Agent Western Province, who will take action thereon. Your Committee hope that members will act on this recommendation, and report all cases of cruelty that come under their notice.

Obituary.—Your Committee regret to record the death in England of Mr. Chas. Ogilvie, a resident proprietary Planter of long standing in the district, and that of Mr. F Drummond, both late members of your Association.

MATURATA AND HEWAHETA PLANTERS' ASSOCIATION.

FOURTH ANNUAL REPORT.

Your Committee beg to submit the fourth annual report, 1899.

Office-Bearers.—Messrs. A C Kingsford, Chairman; R B Roberts, Hon. Secretary.

Committee.—Messrs. G H Bennett, H E Power, G F Deane, D H Williams, L St. G Carey, E Turner, T N Orchard, and H V Bagot.

Kandy Representatives.—The Chairman and Hon. Secretary, Messrs. E. Turner and L St. G Casey.

Meetings.—During the year, three general and four Committee meetings have been held. The roll of membership is 39. The balance in hand is R186·09 as compared with R53·39 in 1898.

The tea crop was generally satisfactory, and in many instances estimates were exceeded.

The estimates for 1900 show a slight increase—

	Total acreage in tea	In bearing.	Crop	Yield per acre. lb.
Maturata	6,733	5,746	2,154,875	381
Upper Hewaheta	4,146	3,580	1,653,000	461
Lower Hewaheta	6,756	6,207	2,317,350	373

Roads.—The Grant-in-aid Road from Padiapallella to Ellamalle has been completed.

Your Committee would again urge upon Government the desirability of continuing the cart road from Loolecondera to Rahatungoda, more especially in view of the increasing traffic thrown on the Hangurankette Road. Further they would urge on Government the necessity of improving the zigzags between the 10th and 12th mile post on the Hangurankette Road.

Bridle Paths.—The bridle paths have been kept in a fair rate of efficiency. Grants have been received from the D R C, Nuwara Eliya, for Rahatungoda-Denika Road R70, Gonavy-Rahatungoda Road R230 and considerable sums in the Maturata District.

Your Committee regret that the amounts received from the D R C Kandy were quite inadequate, and in view of the amounts collected in Road Taxes from this part of the District, and number of natives using the roads, should ask for a more satisfactory vote for 1900. The Committee is glad to report that the bridle path from Upper Hewaheta *via* Ramboda to Nuwara Eliya, asked for by your Association is now in course of construction, and will be of great convenience when opened.

Hospitals.—Your Committee is now able to report that foundations for the Maturata hospital are being cut, and the Director of Public Works hopes to spend during the year the amount provided for in this year's Supply Bill, viz R35,000. Your Committee fail to understand the lengthy delay in commencing this work, considering that this hospital was sanctioned, and a vote on account in the Supply Bill, R20,000 was taken in November 1897. Your Committee are of opinion that a smaller and less expensive building, constructed with less delay, would have been of greater benefit. Mr. Roberts was nominated by your Association, visitor to the Deltotta hospital in November, 1898, but as yet the appoinment has not been confirmed by Government.

Telegraph.—Your Committee have for some years past urged the desirability of telegraphic extension to Deltota and Hewaheta, and regret that the more recent offer to guarantee any loss on the working has met with little response.

Cattle Branding.—This matter, originally brought into prominence by your Association, has again had the full attention of the Parent Association and the public press, and your Committee trust that the Ordinance will no longer be allowed to remain a dead letter, and that instructions will be issued to the police to take action which will minimise this cruelty.

Rinderpest.—A serious outbreak in the early part of the year caused considerable difficulty in carting. We trust that future outbreaks will receive more prompt attention.

Agricultural Chemist.—Loolecondera and Galaha, the selected estates, were visited twice by Mr. Bamber during the year, and we regret that we are unable to report more fully owing to the long delay in printing the report.

Blight.—Your Committee are glad to report that there has been no serious attack of Blight in the district.

Paris Exhibition.—Exhibits of commercial tea, were kindly sent from Bramley estate in Maturata. Columbia estate in Upper Hewaheta, and Great Valley in Lower Hewaheta.

Labour.—Your Committee regret that labour is generally insufficient, and they consider this is greatly due to the closure of the North Road, and consequent enhancement of the cost of bringing over coolies, and would therefore urge on Government that the funds usually devoted (approximately R100,000) to the upkeep and establishment of the Northern Route should, in the event of its being considered advisable to continue this course, be devoted towards subsidising the steamer service for immigrant labour.

Labour League.—This has worked smoothly, and no complaints have been received.

Railway Rates.—Your Committee feel that they cannot do better than repeat their paragraph in last annual report *re* railway rates, viz., "We regret that so far Government have not acceded to the request to lower the rates on tea from the 4th to the 6th class; and would wish to draw the attention of His Excellency to the great difficulties and cost of transport both from Maturata and Hewaheta estates having to carry and cart their produce over difficult roads, from 25 to 35 miles, before reaching the railway. and, in addition to paying rates for cartage, contribute annually in tolls, grant-in-aid roads and private roads R20,000 towards the annual upkeep of roads. All estates have used the railway from the time of its opening, and also contributed towards the export tax, which paid for one-third of the cost of construction and should therefore now, in this time of depression, lay claim to special consideration, more especially in view of the large profits obtained from the Colombo-Kandy section of the line for many years past."

Plague.—Your Committee congratulate the Government and the Planting Community on the immunity of the Island from Plague during the past year, and trust that Government will continue the present most necessary precautions.

Your Committee regret to report that nine estates in Maturata have resigned membership of the Association and that no member from Maturata has attended any meeting during the year, and would, therefore, suggest that the word Maturata be deleted and that in future this Association be called the Hewaheta Planters' Association.

R. B. ROBERTS, Hon, Secretary.

PRODUCE AND PLANTING.

THE TEA TRADE OF THE UNITED STATES.—Some statistics relative to the consumption of tea in America are sent by the New York correspondent of the "Grocer." "The fiscal year of the United States ends June 30. The net imports of tea are taken as representing consumption. Prior to the levying of the present duty tea was not left in Government warehouses as is at present the custom. In 1897 imports were unusually heavy exceeding any former year by nearly 20,000,000 lb. This was probably due to importers buying heavily in anticipation of a duty being levied. This was done by War Revenue Act of 1898, when tea was taxed 10 cents per lb. During the year ending June 30, 1898, the imports were the smallest for any year since 1879, notwithstanding the population increased 25,000,000. When the Tea Act went into force there was a heavy stock of inferior grades and trash on the market, some of which was twenty years old, and had been unsaleable at 2d. per lb. The diminished imports of 1898 and the 5d. duty enabled holders to dispose of the old stocks, which were not entirely dissipated until the summer of 1899. It is a fact that the trash offered at 2d. sold subsequently as high as 11d. The result of counting net imports as consumption causes considerable irregularity in the Government per capita estimate, as it leaves out of consideration stocks in first and second hands."

THE PROBABLE DEMAND.—"The present population of the United States," says the authority referred to, "is estimated at 74,000,000, and the requirements for 1899 should be 96,000,000 lb. The net imports for the year ending June 30, 1899, however were only 72,833,070 lb., falling nearly 16,000,000 lb. below the annual average, and can only be accounted for on the ground that old stocks were larger than estimated, or else that 1·31 lb. per capita is too high as representing consumption. The imports for eleven months ending November 30, 1899, were 77,517,366 lb. So much for the Goverument returns, on which my statement was based, in connection with the fact that withdrawals in November were over 8,000,000 lb. According to private estimate the average monthly withdrawals averaged, June to November 30 7,300,000 lb., or 87,600,000 lb. per annum, and for the next six months are estimated at only 7,000,000 lb. If an average of 7,375,000 lb. were used monthly for ten years ending June 30, 1898, which covers five years of trade depression, it is not fair to assume that, with prosperity never before equalled, and old stocks wiped out, the consumption should increase? In a recent interview with the New York agent of a prominent tea firm having offices in Ceylon and London, and who is a careful student of the situation, he stated that his estimate of consumption was 92,000,000 lb. for the United States, less exports to other countries than Canada, a very small quantity. Undoubtedly roasted coffee at 10 cents per lb.," says the correspondent, "is cutting into the consumption of tea. Possibly I have taken too optimistic a view of the situation, but if so it must be measured by the figures given above, viz., that monthly withdrawals for six months show an annual consumption of 88,000,000 lb."

MR. RUSKIN'S TEA-SHOP.—At one time, Mr. Ruskin, in addition to his other multifarious occupations, kept a tea-shop. "How good of you," he wrote on one occasion to a friend, "to go to the tea-shop; and I'm so glad of your report; I must really get up my sign." But the sign, we believe, never made its appearance. "Owing," Mr. Ruskin has elsewhere explained "to that total want of imagination and invention which makes me so impartial and so accurate a writer on subjects of political economy, I could not for months determine whether the said sign should be of a Chinese character, black upon gold; or of a Japanese, blue upon white; or of pleasant English, rose colour on green; and still less how far legible scale of letters could be compatible, on a board only a foot broad, with a lengthy enough elucidation of the peculiar offices of 'Mr. Ruskin's tea-shop.'" Whether it was due to the absence of a sign or not the Ruskin tea-shop was not a success. It was established at 29, Paddington Street. W., "to supply the poor in that neighbourhood with pure tea in packets as small as they chose to buy, without making a profit on the subdivision." The result of the experiment was, says Mr. Ruskin, "my ascertaining that the poor only like to buy their tea where it is brilliantly lighted and eloquently ticketed; and as I resolutely refuse to compete with my neighbouring tradesmen either in gas or rhetoric the patient subdivision of my parcels by the two old servants of my mother's, who manage the business for me, hitherto passes little recognised as an advantage by my uncalculating public. The business, sad to relate, languished, and the rent and taxes absorbed the profits and something more. This was prior to the ascendency of Indian and Ceylon tea.—*H. and C. Mail,* Jan. 26.

CEYLON TEA IN SOUTH GERMANY.

We are glad to welcome genial and well-informed Mr. Chas. Bohringer back, after an absence in Germany of over two years. During this time Mr. Bohringer has not been idle, more particularly in trying to introduce Ceylon tea into the States of Bavaria, Wurtemburg and Baden; and he is well satisfied with the measure of success attained. The work has been a slow one, owing very much to the opposition of the Hamburg tea merchants; but a considerable hold has now been got and Mr. Bohringer was gratified in November last to obtain a gold medal for his exhibit of Ceylon Teas at the Munich Food Products Exhibition. The "Thirty Committee" should pass a vote of thanks to Mr. Bohringer at their next meeting for the good work he has been doing for our staple. If, as he believes, the people of Southern Germany are going to take freely to good tea, how much more should we expect those in Central and Northern Germany to do so? Now that tea enters duty free into Belgium, Antwerp is becoming a chief port for imports to serve a large part of Central Europe.

SUNFLOWER-GROWING IN SOUTHERN RUSSIA.—According to a French consular report, there is in Southern Russia a growing demand for oil-bearing seed, particularly sunflower-seed. Until recently there had been in that region but few establishments for extracting this oil, and the producers, finding no market at home, sent the seeds to foreign countries. Now, however, there are mills in the south which are prepared to use considerable quantities of these products, and they offer to the cultivators better prices than they could secure in foreign markets.—*Chemist and Druggist,* Jan. 27.

THE RETENTION OF DUTY-PAID TEA IN BOND.

The following circulars have been issued by Messrs, Densham and Sons, Limited, of 49 and 51, Eastcheap, E.C.:—

"January 15, 1900.

"DEAR SIR,—You will probably notice in to-morrow's papers that we have today paid a record cheque for tea duty, amounting to £85,862 8s 8d. This cheque represents a larger amount of duty-paid tea than has ever been held by any wholesale house in the history of the tea trade. We have bought this tea, and paid duty on it, for two reasons. First, because we anticipate a very large demand for duty-paid teas during the next six weeks from all parts of the kingdom, owing to the growing belief that an alteration will be made in the tea duty, and, secondly, because, as you are well aware, during the exceptionally dull months of November and December last, good teas were of far better value than has ever been known. Our purchases were made during these two months, and we are now in a position to meet this demand from our customers, however big it may be. We need hardly say how pleased we should be to send you samples of any class of Indian or Ceylon tea that you may be tasting, and we would expressly ask you not to purchase until you have seen a selection from our stock.

"*We have been informed by the Customs authorities that in future no tea will be allowed to remain in the bonded warehouses, duty paid more than a reasonable time for clearance of same,* and for this reason we are making arrangements for taking the whole of this stock into our new warehouse, which have a capacity of over two million cubic feet. You can therefore leave any purchases you may make from us in these warehouses, properly insured by us, and rent free, until you require them."

"January 20, 1900.

"DEAR SIR,—Referring to our letter of 15th inst., informing you of the payment of our record cheque for tea duty, you will probably have noticed a letter on page 134 of this week's *Grocer*, evidently intended to convey the idea that the statements made in our letter were not correct. The letter is as follows:—'10, Philpot Lane, E. C, January 18.—SIR,—In a recent announcement of new premises, a remark occurs implying that a certain risk is incurred by owners of duty-paid tea, if the tea be permitted to remain in a bonded warehouse beyond a "reasonable" time, whatever that remarkably vague period may mean. As a matter of fact, which may interest many of your readers, there is no time limit or restriction of any kind placed by H. M. Customs as to the removal of teas upon which the duty has been paid—We are, &c., BURBRIDGE, PRITCHARD, and BARTLEET.'

"We are much indebted to Messrs. Burbidge, Pritchard, and Bartleet for giving us this opportunity of stating the exact facts, of which they do not appear to be cognisant. Being most anxious in the interest of the tea trade in general, and of our customers in particular, to find out the true position, we applied to the secretary of Her Majesty's Customs for information on the subject, and to enable you to form your own judgment we subjoin an extract from his reply dealing with the question.—We are, yours faithfully, DENSHAM AND SONS, LIMITED."

Extract of leter from the secretary to Her Majesty's Customs:—

"I am directed to acquaint you that the Warehousing Law implies that warehoused goods which have been cleared for home consumption, and on which duty has been paid, shall be taken from the warehouse immediately. Not only does the payment of duty imply that the owners of goods require them for use, and that they will be removed with the utmost expedition, but the presence together of warehoused and unwarehoused goods in bonded premises imperils the value of security by which the warehouse is covered. This being the position, the Board feels bound to withhold assent to the retention of tea in bond after duty has been paid upon it. I am to add that you are not correct in your impression, that the rules of the department have allowed a period of twenty-one days, or any other defined time, for the removal of duty-paid stock from bonded warehouses after payment of duty."

After seeing Messrs. Densham and Sons' first circular, given above, Mr. Prowse wrote:—

"Many thanks. The underscored part of this notice (given in italics) correctly expresses our attitude, and it is quite intended to exercise all the powers we may find ourselves to be possessed of to prevent the wholesale retention of duty-paid stock in bonded warehouses.

"(Signed) R. T. PROWSE, Secretary.

"Customs, January 23, 1900."

—*Home and Colonial Mail*, Jan. 26.

THE PROSPECTS OF CINCHONA.

Mr. Bohringer confirms our view of the great encouragement now offering to cultivate cinchona—and especially hybrid cinchonas—in Ceylon. He points out that the bye-product, cinchonidia or cinchonia—at one time comparatively valueless—is now as much thought of as sulphate of quinine itself; and further that it is in Ceylon, rather than in Java, bark such a bye-product is chiefly found. He would therefore advise the planting up of a hardy hybrid variety and there is every prospect of prices improving rather than going back, although already they are double what they were some time ago. The United States alone with Cuba, Porto Rico and the Philippines on their hands, are bound to be very large customers; but apart from this, quinine is now utilised in so many directions that a steady and growing consumption is assured. We would strongly urge Ceylon planters in the medium and higher and especially in the Uva districts, not to neglect the planting of cinchona.

SUGAR IN MAURITIUS.

PORT-LOUIS, Jan. 30.

All the estates of the island have now finished the crop. In some factories there is still some sugar to be centrifugalled, as this work could not be done owing to the usual important operations in the fields at this time of the year.

The total yield of the crop, which we had estimated at 150,000 tons, will probably slightly exceed that figure.

The prolonged drought is doing harm to the plantations. It is to be hoped that there will soon be a good downpour all over the island.—*Mauritius Planters Gazette.*

CEYLON EXPORTS IN RELATION TO FREIGHT AND TONNAGE: 1888-1899

TEA GIVING 44 PER CENT, AND PRODUCTS OF THE COCONUT PALM 41 PER CENT, OF EXPORT TONNAGE FROM CEYLON IN 1899.

The following figures—compiled from the Annual Returns of Exports and Shipping—give the quantities of produce exported from Ceylon and the number of vessels by which such produce was shipped. The figures for produce exported are, in this instance, reduced to "shipping tons" on the basis of the Ceylon Tonnage Scale:—

In	Vessels Cleared with cargo.	Tons cargo taken.	Average tons taken per vessel.
1888	573	120,431	210
1889	611	131,849	215
1890	698	156,159	223
1891	872	174,316	200
1892	871	200,986	230
1893	848	197,823	233
1894	808	200,489	248
1895	784	213,843	272
1896	830	216,844	261
1897	756	245,830	325
1898	773	297,211	384
1899	856	293,507	343

The decrease in shipping tons of cargo exported from Ceylon in 1899 is 3,704 as compared with 1898, but compared with 1897 the increase is 47,677 tons. The slight falling-off in 1898 is due entirely to shrinkage in exports of coconut palm products, and mainly to a reduced export of copra.

Going into detail the following figures show which products have mainly contributed to keep the total export to within a few thousand tons of last year:—

		Tons.
Tea shows an increase of	...	10,125
Plumbago ,, ,,	...	7,166
Coffee ,, ,,	...	360
Cocoa ,, ,,	...	409
Cinnamon ,, ,,	...	1,539

The exports of cinchona, cardamoms, sapanwood and ebony do not show sufficient variations from 1898 to call for special comment. As indicated above, exports of the products of the coconut palm for 1899 show a heavy falling-off from those of the preceding year. Grouping them together—coconut oil, copra, desiccated coconut, coconuts, poonac, coir yarn, rope and fibre—the following figures will be found of interest:—

	Shipping Tons.		Shipping Tons.
1888	61,375	1894	85,711
1889	55,780	1895	84,567
1890	72,291	1896	80,570
1891	69,879	1897	100,614
1892	94,550	1898	139,334
1893	79,935	1899	119,154

Of the total exports of the year:—

Tea gives	... 44%	of the shipping tons.
Products of the coconut palm give	41%	do
Other products give	15%	do

The falling-off in exports of the coconut palm showing, as they do, a shrinkage of 20,184 shipping tons for the past year, as compared with 1898, is a very serious one, and it is anticipated that, owing to the restricted rainfall last year, the exports of the coconut palm for the year 1900 will show no better results, if indeed the exports reach those of the past year.

The number of vessels which cleared with cargo in 1899 shows a considerable increase over the figures for 1898. The average quantity of cargo taken per vessel works out naturally under those for 1898. Putting aside some short temporary scarcity of space, the supply of tonnage has been ample for the requirements of shippers, and the continued increase in the carrying capacity of recently built steamers, which run on the Eastern lines, will meet any expansion in our exports.

FREIGHTS have on an average been low.

Tea has varied between 25s and 30s to London. To the Continent freights have varied considerably between 20s and 30s for rough cargo. Freights to Australian ports remain as before, viz.:—R40 per ton on tea to Adelaide, Melbourne, Sydney or Brisbane.

The following are fluctuations in freights on tea by steamers to London:—

	Maximum.	Minimum.		Maximum.	Minimum.
1891	45/	27/6	1896	25	7/6
1892	35/	15/	1897	35/	10/
1893	30/	12/6	1898	40/	20/
1894	35/	20/	1899	30/	25/
1895	30/	17/6			

Vessels which called for coals only, and native schooners, are not included in these returns.

COCONUT PLANTING IN THE EASTERN PROVINCE.

(From a Correspondent of "Colonia": the Colonial College Magazine.)

"I must apologize for not having written before to thank you for the ambulance certificate. When I last wrote I was, I believe, tea planting, up country, but I have now got over my planting babyhood, and am a full-fledged superintendent of one of my brother's estates of fourteen hundred acres. When I first came down here seven months ago it was all virgin jungle, but I have cleared about two hundred acres, which I am now planting up. I have therefore been so busy that I have hardly any time to write. The estate lies on the eastern and hottest coast of Ceylon, and stretches for about nine miles along the seashore. It is, of course, not suited for tea planting, owing to the climate, but is ideal soil for coconuts. Coconuts are one of the most paying products, if not the most paying, in Ceylon; but as they do not come into bearing for ten to twelve years after planting, it entails an immense expenditure of capital in the interim. There are certainly many minor products which may be planted. I myself am planting up Indian corn and chillies, and although both of these products take a certain amount out of the soil, I hope that judicious artificial manuring will replace the good taken out of it. I now regret very much not having attended the agricultural classes at the College, though at that time I had little or no idea of taking up planting. I am thinking of going in for my licensed surveyor's examination, as there is a good deal of work about here; and as I shall soon have a good deal of time on my hands, I could add largely to my income in that manner.

I think perhaps it would not be amiss to warn you about the so-called 'creeper mongering,' it is one of the planting disgraces. A few planters, I am glad to say a very few, advertise for young men to come out here to learn tea-planting, with a promise of a billet at the end of a certain time. They have to pay a premium from £100 to £200. Everything is painted in the most roseate hues. In many cases they are not shown or taught any-

thing personally, but allowed to do what they like, and when they eventually get a billet on R88·33, which is about four pounds a month, unless they are hard workers they get the sack and add to the great army of unemployed planters to be found in Ceylon. Tea seems to be on its last legs, everywhere salaries and staff are being reduced. White men are getting sacked and native conductors are taking their places on a salary about a quarter what a European would get. It will be a case of the survival of the fittest: many estates I expect will be abandoned unless something unforeseen turns up.

This is a magnificent game country, being all virgin jungle; elephants, leopards, bears, buffaloes, pig, deer, peafowl, etc. I shot a cheetah the other night about two hundred yards from my bungalow. We live on fowls down here, as butcher's meat is not procurable, and one's gun is a very useful thing to vary the monotony of the everlasting chicken. I enclose you a cheque for 30/ for my subscription to *Colonia*. I should be very much obliged if I could get the back numbers which have been issued since I left the College."

WEIGHING TEA—AND CEYLON MYCOLOGIST.

In a London letter to the *Observer*, I saw it mentioned that the scales on some tea estates must be wrongly balanced, which would account for the difference of weight which the tea chests would turn out, in London. From my personal experience I know that spring balance scales, such as are used at railway stations, and which, I believe, are the sort used in tea factories also, are in the habit of going wrong on the slightest provocation. In weighing bags of grain, averaging about 200lb. each, these scales generally show a difference of from 2 to 4 lb. per sack, and that would just run out about the amount of deficit on tea chests. I check my scales by having myself weighed on a beam scale, which, of course, is always right, and then trying my weight on the balance scale, allowing the difference between the two. Tea planters should try this plan. Of course, Railway companies naturally patronize a class of weighing scale which enables them to charge more on packages than they are justly entitled to.

APPOINTMENT OF A MYCOLOGIST.

I am glad to see that you are, at last, going to have justice done to your island, in this respect, for a Mycologist is really one of the most useful appointments that could be made in connection with any agricultural or horticultural community. I don't grudge you your good luck in gaining your point, although we agriculturists in Britain are never, by any chance, so fortunate as to get any concession from the powers-that-be, because the policy of our Government, be it Tory, Whig or Radical, is to encourage the foreign agriculturist and crush their own countrymen. Our Minister of Agriculture, Mr. Walter Long, has lately been visiting the Scotch agriculturist on his native heath, and has been bombarded with wild provosts, J. P.'s, kerosine lamps, addresses and other bucolic products; but all to no purpose, for he simply refuses to do anything for the greatest but most depressed industry of our native land. COSMOPOLITE.

NEW GUINEA RUBBER.

It is encouraging to learn that a high value is placed in London on rubber from New Guinea. As much as 3s 4d per pound has been realised for the article in the home market. The reason for this is said to be that adulteration, so much practised in other rubber-producing countries, New Guinea not excepted, has been promptly checked in the Possession. With the cessation of adulteration, prices have rapidly risen for the Papuan production. Let us hope that with the encourgement of quick sales and high prices the collection of rubber will become one of the steady industries of the island.

The *Northern Miner* says on this subject:—"Messr. McIlwraith, McEacharn, and Co. inform me (writes 'city Man,' in the *British Australasian*) that the rubber which they receive from New Guinea has been steadily advancing in value of late, owing to the improvement which is taking place in the preparation of the article. The gentle and unsophisticated nigger, in whatever part of the world he is, has a nasty knack of adulterating the rubber which he sells to the trader, and the Papuan is not an exception to the rule. But this propensity in his case has been firmly checked lately, with the result that New Guinea rubber has been selling in London up to3s 4d per lb."—From the *Queensland Agricultural Journal*.

A CURE AGAINST DYSENTERY.

The Colonial Garden in Indo-China, through the good offices of Senator Pauliat, has received some seeds called "Ko-San" by the Chinese and employed by them as a preventive against dysentery. Dr. Mongeot, of Saigon, had the happy idea of utlising these seeds according to the Chinese methods, and the results have been very satisfactory. Out of 879 cases experimented upon, he met with only eight unsuccessful results. Experiments made at the Colonial Garden have shown that the seeds had a powerful physiological action. New experiments will, no doubt, enable the causes to be traced, and the effects of the action determined. If, as everything seems to point to it, the utility of this Ko-San seed is confirmed, the plant will be spread all throughout the French Colonies.—*London and China Express*, Jan. 26.

THE INDIAN TEA ASSOCIATION (LONDON).

SCIENTIFIC OFFICER FOR THE TEA DISTRICTS.—A letter on this subject from Dr. Voelcker, addressed to Mr. Cruickshank, was read by the Secretary, and at the request of the Committee Mr. Cruickshank arranged to see Dr. Voelcker again and settle with him as to the engagement of a suitable man with the requisite qualifications to proceed to India and take up the appointment.

TRAVANCORE STATISTICS.—After some discussion it was decided that in future it was advisable that estimates of Travancore crop, should, if procurable, be given separately by the Calcutta Association when framing their forecast of the Indian tea crop.—*Indian Planters' Gazette.*

LIQUID MANURE.

A simple and cleanly way of applying liquid manure to pot plants, is first of all to make a strong liquid manure, and into this put dry charcoal. When the charcoal is thoroughly soaked, take it out and dry it. When repotting plants put a little of it into the bottom of the pot. When the roots of the plant reach it, the effect is soon visible. By this means there is no smell as in using the manure in a liquid state.—*Queensland Agricultural Journal.*

PLANTING NOTES.

MICA.—As a correspondent some time ago remarked in an Akyab paper the resources of Upper Burma are plentiful in regar l to mineral wealth, but search is required. We now hear that mica mines have been found in the Ruby mines district and also plumbago. Working up is the caly thing necessary.—*Mandalay Herald*, February 3.

SEED DISTRIBUTION IN AMERICA.—The Department of Agriculture began its distribution of seeds a little earlier this year than last, forwarding them south at the beginning of January. This year the seeds for distribution to all parts of the country will consist or 13,000,000 packets of vegetable seeds, 1,560,000 of flower seeds, besides field and lawn grass seeds.—("Washington Post.")—*Home Paper*.

SIBERIAN FORESTS.—The Russian Ministry of Agriculture has assigned the sum of 50,000 roubles to be expended in the forests in the Governments of Tobolsk and Omsk, in accordance with the methods usually practised in the arrangements of forests in European Russia. The objeet in view is to prevent the increasing destruction of Siberian forests.—From *Journal of the Society of Arts* for January 19th.

COFFEE IN THE STRAITS SETTLEMENTS.—A correspondent writes with reference to the remark of our Sumatra correspondent :—"$21 per picul Liberian coffee won't make the Liberian coffee estate proprietor fat, since it costs him $18 per picul *f.o.b.* when his estate is in full bearing. $40 per picul was the price going when the rush into Liberian coffee was made four years ago in the Malaya Peninsula."

TEA DRYING.—The whole philosophy (says an Indian contemporary) of rapid, economical and thorough drying or firing of tea may well be summed up in the three following points :—(1) The tea should be kept in gentle, but effectual, movement, so as to separate every leaf from every other leaf and allow the dry air to get at *both* sides. (2) The application of as much air as can be introduced without blowing the charge out of the machine. (3) The skillful adjustment of the temperature of that air, so as to obtain the highest drying power without injury to the product; in other words, firing without burning.

BUDDING OF MANGOES.—The following interesting remarks which were culled by Mr Gollan, of Saharanpur, from a quotation made by the Queensland Agricultural Journal from the Bulletin of the Jamaica Botanical Department on the propagation of the mango tree by budding instead of the present laborious and slow process of grafting, are here reproduced for information:—"Budding the mango has been generally considered an impossibility but this is a mistake, because it is done by experts in Florida, and it can be done by others when understood. The secret lies in taking the buds from about the middle of the growing shoot where they are well developed, and yet not too tender where the colour of the bark is just turning from green to purple, and at a time just prior to a vigorous stage of growth in the tree to be budded. The shield method has been used, but the ring or plate would be better."—*Agri-Horticultural Society, Madras.*

MANURING TEA.—Can it be true that Mr. Joseph Fraser estimates the increased crop from "judicious manuring"—such as he recommends—at 200lb per acre. Take half our area as amenable to such treatment and Mr. Fraser will have to face 37 million pounds additional of Ceylon tea! But where is the labour to pluck 148 million pounds additional of leaf? Mr. Fraser must be interviewed by a Deputation of poor tea-estate proprietors!

LAGOS PALM OIL.—The exports of palm oil from 1894-98 were as follows :—1894, £187,297; 1895, £205,553; 1896, 159,150; 1897, 97,590; 1898, £97,337. From these figures it appears that the palm-oil trade is less than half what it was in 1894 and 1895. The falling-off is attributed to rubber having become, since 1894, such a large article of export from the colony, but owing to the injury inflicted on the trees (says the Governor of Lagos) from the reckless way in which it has been collected, it appears certain that within, say, five or six years this industry will fall off entirely. The export of palm-kernels during the past five year remains about stationary, the value in 1898 being £362,539.—*Chemist and Druggist*, Jan. 27.

TEA FACTORIES AND FIRE INSURANCE.—There was some reason for the Maskeliya planters specially interesting themselves in this subject; for of the 18 fires reported by their Committee, two had occurred in their district, against two in Dimbula; one only in Dikoya; two in Madulsima; two in Pussellawa; and no fewer than four in the Kelani Valley, where we should have thought the temperature was too high to encourage fires. We repeat the interesting table with the districts given opposite the estates :—

Fires in Ceylon Estate Factories during a period of eight years.

NAME OF FACTORY.	DISTRICT.	DATE.	
Heatherley Factory	Pussellawa	March	1891
Suduganga do	Matale East	May	1891
Bloomfield do	Maskeliya	Feb.	1894
New Peradeniya Factory	Hantane	Jan.	1894
Alton Factory	Maskeliya	June	1894
Lynsted do	Dikoya	Jan.	1895
Kinnuagoda Factory	Madulsima	March	1896
Great Western do	Dimbula	Jan.	1898
Dunedin do	Kelani Valley		1898
Tembiligalla do	Pussellawa		1899
Knavesmire do	Kelani Valley		1899
Sirisanda do	do		1897
Kanavesmire Sirocco	do	Jan.	1899
Ferham Factory	Dimbula		1898
Battawatte Withering Shed	Madulsima		1898
Dunsinane Brit. Drier	Pundaluoya		1897
Lower Haloya Sirocco	Nilambe		1897
Culloden Factory	Kalutara	May	1896

Total amount paid R385,767.

A merchant, who has paid some attention to the question, writes, after reading the Report :—

"I do not quite understand the paragraph in their report in which they estimate the annual premium value at R187,500. But if that is a fair estimate, the losses amount to 25·72 per cent of the premium insured; whereas the experience of 43 British Fire Offices in 1898 as shewn in Mr. Horsfall's circular of 7th July, 1899, was 56·12 per cent."

THE RICE TRADE OF CEYLON:

Imports from Bengal, S. India, Burmah, &c.

The largest import trade carried on through Colombo, is, as may well be guessed by all who have any knowledge of the local requirements of the article, the import trade in Rice. While the exported quantity of Tea—the largest item in the export trade—last year was close on 130,000,000 lb.; for the same period we notice (see tables on next page) that the imports of rice must weigh about 500 million pounds or not far short of four times the weight of the exports in tea. The trade in rice with this island being of such dimensions as we have indicated, it is worth while to consider its present condition and the changes that have recently taken place therein.

In the first place, referring to the tables which appear on next page, it will be seen that the imports *in bags*, during 1868 are given as 2,790,638 while far 1899 they are 3,031,975 showing an increase of 241,337 bags. From this one would gather that the quantity of imported rice had increased last year as it has done for several years past. On examination of the smaller table, however, it will be found that there has in fact been a *decrease* in the total quantity imported by 14,616 bushels. The explanation of this is not difficult; but to make it plain with all the figures before us, is somewhat less easy. The point is that Rangoon rice is measured in bags taking 3 bushels and not 2½ bushels, as is the case with Calcutta bags; these are the usual measures, but not even these remain continuously the same. Moreover in the cases of nearly every other port the quantity per bag is different: and as the larger table, mentions no less than 18 sources from which our rice was drawn last year it will be seen that an increase or decrease in bags is not a true criterion of the actual amount of rice imported. The decrease in the importations of rice last year is nothing abnormal and may almost entirely be explained by the smaller quantity of estate labour then available in Ceylon.

Now as to the sources of our rice supply, Calcutta, in spite of "plague," still stands easily first · Southern India coming next; these two will, we belive, continue to remain our chief sources of supply. Rangoon comes next; but from Rangoon we are again receiving only the broken rice or chips which have been imported for many years past. The trade in Rangoon rice all over the world is something enormous and the surplus crop alone in this year is estimated at about 2 million tons, a good deal of which it is expected that Bombay will take. But rice in Rangoon is differently prepared from the Calcutta and South India rice; in the latter places it is scalded and when used for cooking with curry has a better consistency and is more liked by coolies. Erom Rangoon there are three kinds of rice, so-called, imported; (1) Cargo Rice—the raw article: (2) Chips, or broken rice, obtained from the mills, and (3) Rice meal, the finer grindings which are used mainly in the manufacture of dog-biscuits. Looking at the imports of Rangoon rice into Ceylon between 1887 and 1897, it will be seen that they vary between 108,000 and 174,000 bags; this all refers to the broken rice or chips, given as (2) above, which is locally imported solely for the making of hoppers and sweetmeats—while in Europe and elsewhere it is taken largely for the manufacture of starch. In 1897, when there was a scare of plague in Calcutta and it was thought that our rice supply from that quarter might be hampered, it was decided to send Commissioners from Ceylon to Burma to select some quality of raw rice which would be suitable for our coolies and could take the place of the Calcutta article; the result of this was that over 250,000 bags of Rangoon rice were imported in 1898 as against 136,709 in 1897. But circumstances were entirely against the new plan and several local firms who took up the matter found the business unprofitable and went back to former ways. First, the cooly was not used to the Rangoon rice; special instructions were issued as to cooking, but were not followed (who ever heard of a cooly forsaking the old culinary methods with his daily food?); chetties, annoyed by the Rangoon imports, kept the coolies up to these complaints, and they had to be listened to; but—most cogent argument of all—the "plague" in Calcutta was a mere scare as far as the rice trade was concerned, and with a huge crop, prices came tumbling down and the old favourite from the Indian capital thus became cheaper than the new stuff, as well as being better liked. And so, in 1899, a normal condition of things has been resumed, the imports have dropped one-half; and these, we learn from special enquiries, are only of the broken rice, used for consumption with other than the pure rice form.

The rice trade with Calcutta has for sometime past been largely in the hands of Chetties; but in June, 1898, a representative of the well-known firm of Grunberg Bros. of Calcutta and Singapore came to Colombo to see what could be done here in the matter of underselling the Chetties, who by their ring had kept the prices above the normal. In October 1898 a branch of the firm was established here and the result was that by competition the prices of rice, as largely fixed by the Chetty community, have been brought gradually down. We learn further that of recent years, or rather month, the Chetties have found that the old profits cannot be made in this trade and the profession of l c l rice-dealers is passing more into the hands of Moors and Bombay Parsees; while the old lords of the rice market are having greater recourse to the pastime of money-lending, for which the special colonial mania for running into debt offers such terrible facilities in the matter of victims, both young and old, in the East.

In conclusion we may express the opinion that only a rise of price in Calcutta is likely to cause a return to Rangoon raw rice, the trade in which at this port has portically ceased for 18 months, and even then it is doubtful if a slight rise would make very much difference. Burma, it is true, has an immense extra crop to get rid of this year; but from recent Rangoon circulars

it is not thought there will be much difficulty in disposing of it. Strangely enough, in spite of the famine that stalks through the length and breadth of India today, Rangoon finds it a hard matter to send any of its surplus to the nearest chief port. The jealousy is great at Calcutta, of the grand supplies from Burma and almost unconquerable; and there is still less possibility of Rangoon rice ever being brought to Calcutta, and re-exported as the Calcutta article: experts would detect the difference at once. From all appearances then it seems that direct from the city on the Hooghly Ceylon will continue to draw its largest supplies of rice, the nearer portion of the Indian continent sending about half the quantity that comes from Bengal. Of other sources Penang alone attracts attention, but the trade from that port is scarcely capable of any marked development in the near, or even distant future.

IMPORTATION OF RICE INTO CEYLON IN 1899:

A NORMAL YEAR.

Since the revision of the Customs Tariff, rice is reckoned in cwt. and not bushels as before, 2½ bushels being calculated at 164 lb.; but we put all in bushels. The importation last year showed a slight decrease on 1898, but an increase on 1897.

1899.	Quantity Imported. Bushels	Quantity entered Home consumption. Bushels	1899.		Quantity Imported. Bushels	Quantity entered Home consumption. Bushels
January	590,486	590,486	July		693,758	693,758
February	644,128	644,128	August		640 477	640,477
March	552,425	551,582	September		752,820	751,980
April	756,787	756,630	October		586,933	586,933
May	507,488	506,640	November		797,832	796,070
June	630,116	630,116	December		536,680	538,326
			Total	1899 ..	7,689,930	7,687,126
			”	1898 ..	7,704,546	7,881,646
			”	1897 ..	7,354,690	7,354,690

OUR RICE TRADE.

IMPORT OF RICE IN BAGS INTO COLOMBO BETWEEN 1877 AND 1899.

	1899	1898	1897	1894	1893	1892	1887	1877
Calcutta ...	1,860,020	1,721,801	1,672,068	1,419,376	1,569,195	1,538,674	1,058,000	1,897,144
Southern India ...	869,823	525,263	763,636	749.649	404,468	640,205	707,848	311,679
Rangoon ...	177,777	350,627	136,709	173,508	160,479	125,505	109,763	5,033
Chittagong ...	...	2,511	...	...	200	...	...	733,555
Ganjam ...	...	...	...	3,303	...	...	...	1,750
Akyab ...	...	...	...	...	...	...	...	...
Golpalore ...	6,118	...	...	63,197	66,109	...	2,480	...
Singapore ...	3,765	7,965	8,053	30	825	15	60	8,200
Bombay ...	9,664	38,249	13,290	7,662	14,223	1,454	1,999	380
Moulmein ...	...	...	...	...	...	.	...	29,790
Balasore ...	...	..	...	...	...	...	...	...
Penang ...	20,961	66,740	16,282	1,076	7,104	...	...	...
Pooree ...	9,589	33,018	4,000	15,344	20,549	14,564	12,730	...
Maldives ..	...	...	...	...	...	...	...	...
Bassein ...	...	...	...	...	...	...	...	3,500
Dhamnerah ..	...	...	...	...	...	...	...	15,400
Saigon ...	...	...	...	...	...	...	...	12,140
China ...	8,275	21,696	1,078	...	5,225	515	...	1,500
Aden ...	...	...	..	...	...	...	...	...
Hongkong ...	...	...	3,230	...	20	28	...	...
Japan ...	3,210	15,550	5,735	60	30	...	...	...
Kurachee ...	...	...	...	...	601	...	...	...
Pooree ...	...	...	4,000	...	..	...	..	...
Pondicherry ...	4,920	201	6,923	...	..	...	..	...
False Point ...	...	...	15,764	..	..	...	..	...
Madras ...	17,699	3,885	8,490	...	..	...	...	...
Tranquebar ...	12,820	3,132	...	...	..	...	...	...
Minicoy ...	5,893	..	..	..	...	...	...	...
Porto Nova ...	1,033	...	...	...	...	...	...	..
Cuddalore ...	2,883	...	...	...	...	..	...	...
Karikal ...	7,247	...	...	...	..	...	..	...
Beta ...	200	..	...	...	...	...	...	...
Total..	3,031,975	2,790,638	2,459,266	2,433,205	2,249,028	2,320,960	1,892,880	2,343,871

SCIENCE AND BUSINESS IN FORESTRY.

WE are getting more practical every day ; and high time we did, looking at the way other nations are catching us up, and even stalking ahead of us in some matters. And there are few things more hopeful and encouraging than the combination of Science with Agriculture. Some of our correspondents, looking far ahead, had insisted many years ago, that the Royal Botanic Gardens at Peradeniya should become self supporting ! A dairy established on the rich grassy banks of the Mahaweliganga, would probably have secured this end ; but such a notion might even now cause good Dr. Thwaites to turn in his grave ! Dr. Trimen was scarcely less conservative as to the scientific character of his charge, though he discussed weather and crops, new products and old, with courage and wisdom in his eminently readable annual Administration Reports. The present Director of the Botanic Gardens has certainly gone farther in a practical direction, than any of his distinguished predecessors : and we may, by-and-bye, find Mr. Willis blossoming forth as the Head of the Agricultural Department, while as a first step, he is likely to take the School of Agriculture under his wing. Then his hands are already greatly strengthened by having as his assistants or allies, men of the experience and attainments of Messrs. E. E. Green, Carruthers and Kelway Bamber, and there should be a good time coming for agriculture in the island with these dauntless scientists ready to take the field against any enemy of plants and crops that may show itself from the animal or vegetable kingdom.

We have, from time to time placed before our readers or commented on, information from India bearing on the same subject. There is, however, another matter on which we have much in common with India, and that is Forests ; and we have had for some years a very capable specialist at work among us from the adjoining Continent. But India, too - in parts at least—is still groping for light, and its experiences and efforts have still their practical uses for us in Ceylon. The Bengal Forest Department is evidently not as far ahead as its sister establishments—only 45 per cent of Government Forests in Bengal having working plans, against 88 per cent in the North-West Provinces and Oudh, and as much as 97 per cent in the Central Provinces. Bengal has, therefore, been called on to move forward—to prepare working plans and find markets for the produce of its forests. So long as the Government has not full information of the potential supply, it cannot control the market in any way ; and the Lieut.-Governor rejects the excuse that the lack of information is due to paucity of officers. If that were so, officers should not have been lent for miscellaneous services elsewhere ; and now all such transfers must cease until Bengal is abreast of other Provinces in working plans ! To facilitate progress, the working plans are to be less minute and elaborate, so that they may be susceptible of alterations and additions from year to year; and the following dictum is one that all specialists would do well to keep in view :—

"Forest Officers must realize more than they do, that they are the agents of a great commercial undertaking, and that as such, they are not merely the scientific protectors of an important property, but active exploiters, whose business it is to seek and develop markets for the produce that is ready for use."

As a beginning, a central depôt is to be established in Calcutta "to foster the exploitation of miscellaneous forest produce in remote portions of the province," and, among others, the mica industry is to have special attention paid to it. Altogether, Sir John Woodburn seems intent on making matters "hum" in the Forest Administration of Bengal ; and it is quite possible that Ceylon too may benefit from a similar stimulus ?

CEYLON COOLY IMMIGRATION AND THE NORTH ROAD—MANURING TEA.

A proprietary planter in a high district, writes after the following rather "wild," fashion :—

Now is the time when coolies come down the North Road, and people who have nothing cannot afford a matter of ten rupees. As to advances, money sent is always retained by the kanganis who return saying they cannot get coolies and casually say put the amount against me. That's the sole reason advances are not now given out. The law gives us no redress, but only says recover your money by civil suit. We cannot get money sent to the Coast to those who would use it in coming over. Our immigration agency is a farce ; it is absolutely of no use whatsoever. Give us an agency where money can be sent for *bona fide* coolies and get estates some protection, then there will be lots of money forthcoming. The wily kangani, as you call him will keep the money whether he comes by Tuticorin or the North Road. What we want is a free inlet for people to come on their own account. When need drives them, they would soon utilize it and knowing it come again. In my opinion it is the kanganis who are keeping coolies out of the country for their own ends. In days gone by coolies would have flocked down the North Road in thousands on their own account during their famine, but now this is denied. [But has our correspondent not seen that for years, fewer and fewer coolies have been coming by the North Road and that the enormous immigration of 1897-98 came through "advances" by steamers?—ED. *T.A.*]

But, on the other hand, an even more experienced planter says :—

Cooly Immigration—I fancy the great cutting down of coast advances after the too liberal giving out of same has a great deal to do with the sudden decrease in immigration. There is now a tendency to go in for the old style of modified coast advances. It is no use manuring, if you have not the labour to pluck the leaf, and I fancy Mr. Joseph Fraser, our Manuring expert, is too shrewd a man to recommend the application of manure to give 200 lb. tea extra per acre, unless he is satisfied that his constituents have plenty of labour available.

COCONUT PLANTING would seem to be going ahead in the Fiji islands, to judge by a letter on page 604; but then there is the liability to have young and even old clearings swept away by periodical hurricanes, from which Ceylon is so wonderfully free.

TEA AND COLONISATION.

Our Southern contemporary, *Planting Opinion*, in quoting our leader in a recent issue on "Famine Colonisation and Tea," says "*Indian Gardening*," appears to lean towards a great scheme of State colonisation, remarking that if this were established, and planters assured of a regular supply of labour, it would be possible to pass a regular stream of agriculturalists through the tea gardens to the land. We need scarcely point out, however, that success would depend largely, if not mainly, upon the regulations enforced, and with the Assam Emigration Bill in mind, we are disposed to hesitate before arriving at the conclusion that a State scheme is desirable. Certainly, 'there is no reason to doubt that effect could be given to such a scheme if the Government would take it in hand, abandoning its present merely restrictive attitude and adopting instead a spirit of hearty co-operation.' But is there not grave reason to doubt whether such co-operation can be expected from a Government that endeavours to control the scale of pay as between employer and employed, when it does not itself figure as one of the employers? The answer to this question should come from the North. We need only remark that to us it appears an anomaly and a scandal that the Government of India should so persistently manifest a desire to interfere between the planter, employer, and his emplyes, when it does not even pretend to have any concern for the relations of employer and employe in other industries—such, for instance, as the enormous mill industry that has been developed in India, or the still more important agricultural industry, which affords examples with which the planting industry cannot vie, of what might strike impartial economic scientists as an abuse by the employer of the helplessness of the employed. Again when labour is required for the construction of State or State-aided railways, what restrictions are imposed on the migration of labourers? We are not suggesting that Government should be consistent, for we value too highly what little reputation for sanity we possess. Our sole aim is to hint that inconsistency and eccentricity might be kept within bounds even where the administrative measures of the Government of India are concerned." Our contemporary is evidently afflicted with the historic doubt, whether anything good can come out of Nazareth. We have already had occasion to complain that the Government's Intelligence Department on these questions is not very efficiently worked, but beyond this we do not see reason to go. With full information before it, we believe the Government will give a large measure of justice in time to our industries; and it is the province of the press to see that the deficiencies of official intelligence departments are supplied. At the same time, perhaps, it might be as well for the press to set a good example to Government in dealing fairly and temperately with the questions at issue, and in avoidance of imputations of bad faith.—*Indian Gardening*, Feb. 8.

TEA BULKING AT THE PORT COMMISSIONERS' WAREHOUSE, CALCUTTA.

We have much pleasure in giving publicity to the following from Mr. Apjohn, Chief Engineer in the Port Trust, which explains itself. The views to the Calcutta Tea Traders' Association on this subject will be found in another column:—

To the Editor, "Indian Gardening."

Dear Sir,—Your leader in this week's *Indian Gardening* expresses approval of the introduction of local tea bulking, but gives vent to doubts as to whether the bulking can be accommodated in the Port Commissioners' Tea Warehouse unless it be extended, and you deprecate the bulking being conducted at the Kidderpore Docks. It is proposed to have bulking plant at the Kidderpore Docks in the new tea-shed being provided for the reception of garden teas sent for direct shipment, and it is for such teas that the Commissioners were asked to provide local bulking, and the Kidderpore Docks is the proper place to conduct it.

For sale teas the bulking must, of course, be in the Tea Warehouse, where plant will also be provided, and it will not be found that this plant will take up a large portion of the floor space which, as you rightly state, is at present in much demand. One of the great advantages of my system of bulking is that but little space is required for its accommodation. Teas to be bulked are brought to the machine from where stacked in the Warehouse, the chests are then opened and their contents poured into the bulker, the empties sent down by a slide to the ground-floor where they are fed to the power packer and delivered ready for closing. All the floor spaces occupied by the bulker and the operations connected with it allowing ample room for temporarily stacking teas brought for bulking. Opening the chests and closing again on the ground floor does not exceed 6 per cent of the floor area of the Warehouse. The bulker and power packers would be quite capable of dealing in a week with the largest number of chests ever sold at the weekly sale.

Several tea experts who have considered the matter agree with me that the provision of bulking facilities will in time tend to economy of space, when it is recognised that bulking can be effected much more quickly than the present laying down to draw samples, and in time it will become largely the custom to have teas bulked on arrival in the Warehouse before sale, which will not only save time, but afford better samples than are now obtained by laying down each chest and drawing a sample from it. Teas laid down for the drawing of samples occupy for each chest an area of 6 square feet for an average time of 24 hours, whereas stacked to the usual height each chest requires only one square foot of floor space. If the laying down of teas was abandoned for bulking, the Tea Warehouse could accommodate quite three times as many chests as at present.

The business of the Warehouse is rapidly growing, and it is desirable that its accommodation should be increased, but the installation of bulking plant will tend to reduce, and not to increase the pressure on its resources.—Yours faithfully, J H Apjohn.

Calcutta, 2nd Feb. 1900.—*Indian Gardening*' Feb. 8

MINOR PRODUCTS REPORT.

Citronella Oil.—Ten lots have been sold recently at 11d per lb, c.i.f.

Cocoa Butter.—The auctions to be held in Amsterdam on February 6th will consist of seventy tons VanHouten's, twelve tons Helm, and four tons De Jong; while on the same date in London 110 tons Cadbury's brand will be offered.—*Chemist and Druggist*, Jan. 27.

"The Indian Forester."—We have received the January number, the contents are as follows:—Original Articles and Translations—The Production of Sandalwood by C D M'Carthy; Natural Coppice, by Sir Dietrich Brandis, F.R.S., K.C.I.E.; The Forests of Cochin China; Correspondence—The Treatment of Bamboos, Letter from C P Fisher; Is Poinciana Elata a wild tree in India? Letters from F Gleadow and Jaikrisna Inderji; A destructive Fungus on Xylia dolabriformis. Letters from R S Troup; Official Papers and Intelligence—The Treatment of Rubber with Alum in Penang; Reviews—Forest Administration in the N.-W. P. and Oudh, during 1898-99; A list of the Trees and Shrubs of Pilibhit, Northern Oudh and Gorakpur; Extracts, Notes and Queries; Timber and Produce Trade; Extracts from Official Gazettes; Appendix Series.

Correspondence.

To the Editor.

PARADUA AND SUGAR IN CEYLON

Sir,—Your correspondent in Saturday's paper is surely mistaken in referring to Paradua as in the Kalutara District. Is it not in the Matara District? And did not good old J W Home acquire the mills there and himself bury a lot of money there? But as you say, the failure of sugar in the past does not necessarily mean its unsuitability for parts of the island in which it had never been tried, especially with improved methods of cultivation and new appliances for manufacture. What a man Home might have been had he not a yearning for great things, for ventures beyond his means? But he was a man of great grit. OLD HAND.

[His career in Ceylon was a romance.—Ed. *T.A.*]

LONDON COCOA MARKET: PRICES LIKELY TO RISE.

London, E.C., Jan. 26.

Dear Sir,—Thanks for your *Observer* of 5th January. In the paragraph on Cow Tail Hair, you print "in bales of 3,400 lb." It should be "in bales of 300 to 400 lb."

I read Mr. E O Darley's letter on "Cocoa" in Mexico with great interest, but I cannot make out his calculations. He speaks of planting his trees 15 feet apart=200 trees (about) to an acre. He then estimates 50 pods to the tree which gives (Ireckon) 4 lb. dried cocoa, not more. This would make 800 lb. dry cocoa per acre or 2,000 lb. per hectare, against the 4,500 or 5,000 lb. he speaks of. How does he arrive at his calculation?

Messrs. C M and C Woodhouse in their annual report on cocoa say: "The market opened with a generally quiet tone, but by the end of Feb. there was a moderate advance in value of all British Possessions kinds, which did not extend to those of foreign growth, and then, when the larger arrivals began to press upon the market, there was a steady decline for all descriptions, which prevailed till the middle of July. Subsequently the demand for West India and Ceylon decidedly improved, and this continued with occasional periods of flatness, to the end of the year, by which time prices showed a considerable advance for Trinidad and fine Ceylon."

These gentlemen give the following figures as the consumption in the different countries from which we have been able to obtain reliable information:—

	mths.	1899. lb.	1898. lb.	1994. lb.
United Kingdom ...	..12	34,013,812	32,087,084	22,441,000
Germany	..11	37,255,300	32,351,100	17,227,100
Holland ..	..11	28,923,600	29,086,900	19,896,300
France ..	...11	35,383,400	35,145,900	30,112,300
Spain ...	..11	12,467,500	9,592,300	1,166,800 (10 mths.)
Italy ...	...11	778,200	690,400	471,700 (10 mths.)
Belgium ..	..10	3,233,900	2,602,400	——
Austria ..	..10	2,636,300	2,337,400	——
United States	..12	35,260,000	21,095,700	15,940,500
		189,951,712	164,989,134	107,255,700

The Russian figures are not given, but this country which is, I believe, a very good customer of Ceylon cocoa, is I read also greatly increasing its consumption. The increase in the American demand is fabulous, 66 per cent in a year. It is true that 1898 may have been a bad year owing to the w r and other reasons, although with us the Boer war is stimulating our consumption, but even then it is a great jump. It is rather curious to note that by "the bag" the increase only shows a rise of 38 per cent. The figures being for New York:—

Imported, 210,272 bags in 1899 against 151,956 bags in 1898.

Consumption, 197,200 bags in 1899 against 140,638 bags in 1898.

This shows the average weight per bag in 1899 was 180 lb. against only 150 lb. in 1898 due to a much larger proportion of Trinidad cocoa (packed in heavy bags) being imported in 1899 than in 1898. From Trinidad direct 44,675 bags were sent last year against 32,952 bags in 1898 and I believe last year a good deal of Trinidads were shipped to the States from the United Kingdom than there were in the previous year.

At the public sales this week, 2,054 bags Ceylon cocoa were offered, and nearly all sold. At the sales alone 1,805 bags changed, and though since the sales holders are asking higher rates than buyers as yet care to give, there is no doubt those who have to buy must give way to the sellers, as there is so very little unsold. Other growths are still coming forward slowly. The "Cheniston" has arrived, however with 3,300 bags of Grenada cocoa which they are trying to get up for sale next week: but it will be a month I reckon (from the reliable information I received from Trinidad) before any such quantities of Trinidads are likely to be received. I think the following are about the fair values of Ceylons today:—Common to fair native 68s to 72s; good native 73s to 79s; fine (native 83s); small, fair to fine (estate) 63s 6d to 75s 6d; ordinary 67s 6d and 68s 6d; medium to fair 76s to 83s 6d; good to fine 84s to 91s. The sales include S, L, in diamond 68s 6d; MAKM 69s; MAK 71s; C in diamond 68s to 69s 6d; HMS & Co. in diamond 140 bags 70s; Kepitigalla 82s 6d and 84s; Ukkuwella, Lower Haloya 83s 6d; Hylton 84s; Patharagalla, Ingurugalla, and Maousava 84s 6d; 86s 6d was bid but refused for "Pallie"; Polwatta 85s, sold; Meegama 90s; Yattewatte 90s to 91s.

I should not be surprised before the year was out, owing to the war and the large increase in the general demand, to see cocoa very high; for in all probability the demand during the next three or four months when the crops will be coming in will be large enough to prevent any appreciable increase in the stocks, so that we shall have September come with depleted stocks and the few pickings that straggle in as usual at that time of year. Trinidads now are worth 81s to 83s for good to fine red and Grenadas 72s to 73s 6d. Guayaquils are also higher with very little on hand to offer.—Yours truly,

HAROLD HAMEL SMITH.

I enclose a cartoon I have drawn (I apologise for the quality) showing what I believe to be a very fair idea of the Mincing Lane opinion of last year's Liverpool cocoa market. —H.H.S.

COCOA.

London, E.C., Feb. 2.

DEAR SIR,—Letters received this mail from Trinidad, dated 18th January, still complain of the lateness of the crops, and the stores say it has caused them to have a very poor Christmas. Those, however, who were fortunate enough to have any cocoa obtained good prices, fine estate marks selling as high as $16 75 locally=84s in London. The weather in most quarters is still too dry, Port of Spain itself seems to be having more rain than the country. The Island had only shipped 3,276 bags to the 18th January (2,508 to Europe, 768 to U.S.A.) against 9,672 bags at the same time last year.

The cocoa sales went off this week very irregularly, the Government being again buyers, however, gave some growths especially Trinidads a very much firmer tone than would otherwise have been the case, but even they were cut out in several lots. This caused Grenadas and Dominicas also to sell well. The demand for Ceylon was the most irregular perhaps; but on the whole, especially as sellers were firm, the lots sold were fully up to valuations. Since the sales the news that some 2,000 bags Java offered on the 31st at Amsterdam had all sold considerably above valuations, also no doubt helped the market, for I was shown a lot of fair red native, mixed break, for which only 70s was bid at the sale, but had now been sold at 73s.

Judging from prices obtained at and after the sale I quote the following rates today for Ceylon's :—Common to fair native 67s to 73s, small fair to good 61s to 69s, mid red 75s 6d to 77s, fair red 78s to 80s, good red 83s 6d to 87s 6d, fine 95s. About 1,400 bags in have changed hands this week. Of other growths Trinidads went steady to 1s higher selling from 79s to 84s. The principal feature in this growth was the sale of some 400 bags good middling to good red 82s, which was only valued at 80s to 81s, Grenadas sold from 69s for fair red to 7 s for fine marks. The Guayaquils were nearly all bought in but since the sales about 1,000 bags have been sold at 72s 6d for 73s for Caraquez.

During the week ending 27th, 2,042 bags of Ceylon and Java were landed, and 1,562 bags were delivered, leaving a stock of 8,363 bags. As far as I can see about 800 bags will be offered up next week, when about 5,000 bags, of all growths, principally Grenadas, will be offered—as well as 110 tons of Cadbury's cocoa butter, and 100 tons of Shells.

I hear the Mazzawatte Tea Company are beginning to move into their new warehouses near New Cross, also that they have paid the Customs a cheque for £85,000 odd as duty on some six million lb. of tea.—Yours very truly,

HAROLD HAMEL SMITH.

A PLANTER'S ADVICE TO PLANTERS: CONCENTRATE AND CULTIVATE ONLY THE BEST LAND.

Coonoor, Nilgiri Hills, Feb. 9th, 1900.

DEAR SIR,—I find that here and in Mysore the advice contained in the long letter you did me the honor to publish, has been acted on. Poor lands are being abandoned, and the waste of labourers has been reduced. I had a long talk with one of the leading merchants of Bombay (largely concerned in the cotton industry at that city), and find that they are setting to work—either to reduce wages, or to get more work be done for those at present paid, and the movement has spread to the North of India. I only hope that the action of the Indian planters has spread to Ceylon. If they cultivate highly, and only the best land, they will, of course, economise all along the line; and the key of the whole position, in other words, is the restriction of cultivation to the best land. What often happens here, and at home, is that money is made on the good, to be thrown away on the bad land. The President of one of our Mysore Planters' Associations tells me that my views have been almost universally accepted, except by a few who are entirely in the agents' hands.—Very truly yours,

ROBERT H. ELLIOT.

[We cannot speak of much abandonment of land in Ceylon as yet by our tea planters—"coffee" here is practically a thing of the past altogether—a few corners and a few fields of plantations may have been given up, but that is about all. On the other hand, there is little or no extension in fresh planting for this year; but in regard to "manuring" a good deal is being done, where there is labour, and as it is calculated that. if "judiciously" carried out, such manuring means an addition of 200 lb. tea per acre to the crop, we have to face the contingency of heavy additions to our exports, though no doubt a good deal of allowance has been made in the P A. estimate for 1900 which is 138,000,000 lb. against 129,894,156 lb. actually shipped in 1899. Mr. Elliot, we believe, however, is chiefly interested in coffee and cardamoms? Of the latter, there is not much prospect of extended planting in Ceylon, suitable soil well sheltered being scarce.—ED. *T.A.*]

COCONUTS IN FIJI AND MEAT TINNING.

Feb. 10.

DEAR SIR,—Enclosed are cuttings from *Fiji Times* Editorial of 6th Jan. I cannot help thinking that the estimate of 10,000 acres being planted annually in coconuts by the natives is a gross exaggeration. It is worth enquiring about. The fact that Fiji has started meat tinning shews that cattle have wonderfully increased in numbers during recent years, far in excess of local requirements. The country is well adapted for cattle as I have often told you and they thrive and breed well there.

A large stock-owner in Fiji has just written to me saying he is very glad the tinning business has started and complaining that his fine fat cattle only fetch £5 a head at present time. They expect a heavier copra crop this than last year.—Yours truly,

PLANTER.

While the larger portion of the Windward Islands is almost solely devoted to the raising of coconuts, where something like 10,000 acres are being planted annually by the natives, and every tree preserved and taken care of, the main island, Viti Levu, comprising 2,500,000 acres, is devoted to the raising of sugar cane and fruit.

Another industry to be initiated for the first time in Fiji early this year is the tinning of meat. This would appear to be a step in the right direction and should largely assist stockowners to realise a better

price upon their herds. For some two or three years past New Caledonia has been engaged in the industry, and has been importing cattle from Queensland for tinning purposes, but consequent upon the tick pest at the source of supply the industry has been hanging fire. Once it has been demonstrated th t tinning meat as an industry will pay, and the many broad acres which at present remain idle will be devoted to the raising of stock.—*Fiji Times*, Jan. 6.

PLANTERS AND TOPICS OF THE DAY IN CEYLON.

Dikoya, Feb. 10.

SIR,—I write *re* several matters of interest to the planting community.

1. Ceylon Labour Federation.—I have followed with the greatest interest the career of the Federation, ever since its conception was first publicably introduced to the planting community by Mr. L. St. Geo. Carey of the Maturata and Hewaheta Planters' Association. The Federation is "good:" has done "good," and will do "more good:" any shortcomings in the working of it are not due to the Federation; but due to those members, who are too slack or too casual to lay breaches of the rules before the Federation Committees, and yet who will on the strength of what are often imaginary wrongs, run down the Federation, without trying to set right what they know to be wrong. I do not believe there is a man who could show just cause of complaint against the Federation, and though I know many who run down the Federation, just by "*summa*" talk, I have not yet met a man who could show that he had laid his cause of complaint before the Federation Committee, and yet had cause to complain. Let all members act up to the Federation rules, and prosecute before the Federation Committees all breaches of the rules, and all will be right. I agree with Mr. Lane that previous employers should be communicated with before steps are taken to employ coolies; but I would point out that this is not a Rule of the Federation, and so need not be done; and I feel sure that the majority would be opposed to the recommendatory resolution to that effect, passed by the Federation Committee becoming a rule, thus showing what is actually thought of the recommendatory resolution from a business point of view. That a tundu once given is good should be clearly understood by all Federation members, and what are called "perili" tundus should not be allowed by the Federation. All districts should have their Federation Committees, and no breach of the rules should be passed unreprimanded.

2. Ceylon S.P.C.A.—Now that the question of supporting this Society is before the Planting Community, we must hope that it will meet with every success. Could not the bigger Associations like the Dimbula P. A., Dikoya P. A., Northern Districts P. A., and Maturata and Hewaheta P. A. appoint representatives in each of the several districts they cover: thus Dimbula P. A., Dimbula and the Agras; Dikoya P.A., Dikoya and Bogawantalawa; Maturata and Hewaheta P. A., Maturata, Hewaheta and Deltota? Increased support means more Inspectors, and Inspectors are men with the time at their disposal, and the purse of the Society at their backs, and whose duty it will be to prosecute on behalf of the Society. Personal support, both moral and financial, is what the Society wants, and then perhaps we shall see less of the cruelty which is so rampant, like the cruelty in cattle branding, &c., &c. Most planters have no time to prosecute, whereas it will be the Inspectors, duty to do so, and to get more Inspectors, financial help must be given: hence the need of personal interest, throughout the planting districts in the work of the Society.

3. Railways and Labour Supply.—This is a very serious question indeed, and it is about time H.E. the Governor told us what practical steps he had taken to secure a Labour Force, sufficient for the works to be undertaken; so that the anxiety felt as to the possibilities of interference with planters' labour, should be relieved.

4. Rice Averages.—I have looked in vain for January's rice averages in all your issues up to date 9th inst. Could you not always make it a rule to publish the monthly rice averages of each month, during the first week of the following month. Many who, like myself, pay for rice on your monthly quotations, would be glad if you could do this.—Yours, &c., PRO BONO PUBLICO.

[Rice averages appeared in the *Observer* of 1st Feb., eighth page.—ED. *T.A.*]

TEA BUSH ROOTS AFFECTED.

Colombo, Feb. 13.

DEAR SIR,—I send herewith a portion of a tea bush (three-year old) from a high estate, which is dying from the root, and shall feel obliged if any of your readers can inform me the cause of same. Thanking you in anticipation,—I remain, dear sir, yours faithfully, E.

[The following is the report of the Entomologist.—ED. *T.A.* :—

The tea bushes just to hand. The roots are covered with some fungus—a white mycelium, which may be the early stage of thread blight. The trees have possibly contracted the disease from decaying roots of jungle trees or even large accumulations of buried prunings.—Yours truly,

E. ERNEST GREEN,
Government Entomologist.

Peradeniya, Feb. 15th.

P.S.—If your correspondents would send their specimens *direct* to this department, they would reach us in a better condition for study. It is very difficult to determine diseases after the plants have dried up.—E.E.G.]

COFFEE PLANTING IN QUEENSLAND.—Another Ceylon planter is added to the list of those who have settled in the Australian Colonies. Mr. Louis Battinson has taken up some coffee land (a few acres planted and some reserve) in the Cooktown division of Queensland and he reports no fungus nor bug, while crops are supposed to average 10 to 12 cwt. per acre; but the country is one where the white man has to labour for himself and where he enjoys it as well. There being a Customs Duty on coffee imported, the local grower has that advantage in his favour. We trust Mr, Battinson will make a success.

PRODUCE AND PLANTING.

Only this, and Nothing More.—Three firms in the City, Messrs. Appleton, Machin, and Smiles, Limited, Messrs. Peek Brothers and Winch, Limited, and Messrs. Joseph Tetley and Co., recently addressed a letter to the Chancellor of the Exchequer requesting him to make an early statement as to the intentions of the Government with regard to the tea duty, and pointing out that great disorganisation of the trade was at present being caused by the large sums of duty being paid upon tea in anticipation of an increase. They have received the following reply :—" Gentlemen,—I am desired by the Chancellor of the Exchequer to acknowledge the receipt of your letter of the 23rd inst., asking the Government to take the earliest opportunity, on the assembling of Parliament, to announce whether or not the tea duty is to be increased in the present year. In reply I am to say that he thinks you will see on consideration, that for obvious reasons no information on such a subject could be given before the introduction of the Budget, for which the time has by no means yet arrived. He regrets to learn that there is any speculation in the tea trade of the kind to which you refer. The unwisdom of such action was proved last year in the case of tobacco. Yours faithfully, L. A. Guillemard."

United States Tea Importation.—The following circular, containing regulations as to the importation of tea, has been issued by the Treasury Department of the United States :—" As tea is now subject to duty, and as the original regulations fixing the penalty of the bond given by the importers thereof at one-fourth the invoice value of the tea was prescribed when on the free list, Article 1 of the Regulations of April 4, 1899, in regard to the importation and inspection of tea under the Act of March 2, 1897, is hereby amended to read as follow: The importation of any merchandise for sale as tea, which is inferior in purity, quality, and fitness for consumption to the standards fixed and established by the Secretary of the Treasury in accordance with Section 3 of the Act of March 2, 1897, is prohibited. Entries of tea will be made upon the ordinary warehouse forms, and the entry will contain the words, 'To be stored at —— pending examination under the Act of March 2 1897.' A bond shall be taken from the importer that such tea shall not be removed from the warehouse until released by the collector. This bond shall be under a penalty equal to double the amount of estimated duties on tea, and shall also be conditioned for the payment of all Custom House charges which may attach to the merchandise prior to its being released, exported, or destroyed, as the case may be, under the provisions of the law."

One of the leading Indian Tea Garden Companies in London recently received a communication from a country grocer, with the following modest request: " Have you an Indian or Ceylon tea that you can put in for 5d or 6d duty paid? If so," says this ingenuous correspondent, "send samples and price list." This would-be patron of British planting enterprise should try Hamburg.—*H. and C. Mail*, Feb. 2.

THE BATAVIA QUININE AUCTIONS.

It has now been definitely settled that in the course of the present year five auctions will be held at Batavia, at each of which from five to six tons of sulphate of quinine are to be offered. The Bandong factory will therefore require a quantity of bark not less than 500 to 600 tons. At a meeting held on October 12th last, it was stated by the directors of the Bandong works that at that moment they had at their disposal sufficient bark to produce twelve tons of quinine, and during the meeting they secured options from various planters for further parcels estimated to produce nearly fourteen tons more, giving a total of twenty-six tons of quinine. This does not include any Government bark, so that it appears that there will be ample quinine manufactured in Java to meet the requirements of the auctions. The first auction will be held at Batavia on February 28th. The dates of the other auctions are unofficially stated to be April 25th, June 27th, August 29th, and October 31st.—*Chemist and Druggist*, Jan. 27.

THE TREATMENT OF RUBBER WITH ALUM IN PENANG.

Copy of a letter No. 1799, dated the 29th September 1899, from the Inspector-General of Forests, to the Assistant Superintendent, Gardens and Forest Department, Botanic Gardens, Penang.

I have the honour to say that I have read your letter of the 31st December last, to the address of the Director of the Royal Gardens, Kew, regarding the treatment of rubber during the process of extraction with alum, with much interest. During some rubber-tapping operations which were lately undertaken in Assam much inconvenience and loss of rubber was occasioned by the wet weather. It appears that the treatment adapted by you greatly facilitates the extraction of the rubber in wet weather, and that this treatment in no way affects the value of the rubber. I should feel much obliged if you would be good enough to favour me with a full account of the treatment, as I should like to have it tried in Assam.

Copy of a letter dated 18th November 1899, from the Assistant Superintendent, Gardens and Forest Department, Botanic Gardens, Penang, to the Inspector-General Forests.

I have only just returned from leave, or your letter of the 29th September would not have remained so long unanswered.

The report of the expert to whom the Kew authorities submitted the samples of rubber was that the alum treatment does not interfere with its value. You can either stir in a pinch of powdered alum or dissolve the alum first in water, I prefer the latter. You will find that by this treatment you will get out all the rubber there is without loss of time.—*Indian Forester*.

THE AMSTERDAM CINCHONA MARKET IN 1899.

A review just received from Mr. H A van Overzee, of Amsterdam, gives some interesting statistics and other particulars of the bark market at Amsterdam during 1889. The small shipments of bark in January and February caused a considerable rise in the prices at the early sales; in fact the average unit, which in January was about 4·70c., rose in March to about 10·90c, an increase of about 130 per cent. When, however, it was found that the March shipments, and subsequently those of April also, were above the average, and that the previous small shipments were not due to scarcity, but to accidental causes, a reaction set in, and prices gradually dropped with continued large shipments, until in September, 1899, the average unit had come down to about 5·35. After this there was again an improvement, and at the last sale of the year the unit was, on the average, 7·75c. The improvement in the prices, notwithstanding larger shipments, would point to a steady increase in the demand for Java bark.—*Chemist and Druggist*, Jan. 27.

TO ALL PARTS OF ASIA, AFRICA, AMERICA AND OCEANIA.

Seeds & Plants of Commercial Products.

Castilloa Elastica Cervantes.—Orders being booked for the coming crop of seeds available in March and April, selected seed from very old trees. R. N. Lync, Esq., Director of Agriculture, Zanzibar, writes under date 24th August, 1899:—"Please send me 200 seeds of Castilloa Elastica for further trial; the seeds of Castilloa you sent me last August germinated very well." Price and particulars in our Circular No. 32; special quotations for large orders according to quantity; immediate booking necessary to avoid disappointment.

Hybridised Maragogipe Coffee.—A larged-beaned superior variety of Coffee in demand; orders booked for the coming crop of seeds, February and March delivery. Price according to quantity on application.

Hevea Brasiliensis (Para Rubber).—Orders being booked for the coming crop available in August and September, 1900. This is the only crop of seeds in the year. All orders should reach us before the end of July to avoid disappointment, as we have to make arrangements in time; guaranteed to arrive in good order at destination. We have already booked a large number of orders. A Sumatra Planter writes, dating 9th March, 1899:—"I consent to the price of £——per thousand. I herewith order 50,000 upon condition that you guarantee at least 33 % seeds germinating." Plants can be forwarded all the year round in Wardian cases. Price and particulars as per our Circular No. 30. A Borneo planter writes dating, Sandakan, 17th August, 1899:—"The last lot of Para seeds turned out very well."

Ficus Elastica (Assam and Java Rubber.)—Seeds supplied by the pound with instructions; price according to quantity. This tree grows equally well in high and low land, in forest and grass land, its cultivation being extended largely by the Indian Government. For price of seeds with particulars as per our Circular No. 33.

Manihot Glaziovii (Ceara or Manicoba Rubber).—Fresh seeds available all the year round; price as per our Circular No. 31. It is superior to Mangabeira rubber and second to Para rubber.

Urceola Esculenta (Burma Rubber) and **Landolphia Kirkii** (Mozambique Rubber).—Seeds and plants, both are creepers.

Cinchona Seeds.—Different varieties.

Sterculia Acuminata.—(Kolanut). Superior quality, seeds and plants; price on application, packed to stand the transit well for several months, a hardy tree, cultivation easy.

Erythrina Lithosperma.—Thornless variety, new crops of seeds ready in December, May and June. Price according to quantity on application.

Seeds and Plants of Cinnamon, Nutmeg, Clove, Sandlewood, Pepper, Cardamom, Vanilla, Arabian, Liberian and Maragogipe Coffee, Cacao, Tea, Coca, Fibre, Medicinal and Fruit Trees. Shade and Timber Trees, Eucalyptus various varieties, also Palms, Bulbs, Orchids, &c.

Our enlarged Descriptive Price List of Tropical Seeds and Plants of Commercial Products for Foreign Countries for 1899-1900 are now being forwarded to applicants in different parts of the world. Also Descriptive Price Lists of Seeds and Plants of Fruit Trees, Bulbs, Tubers and Yams, and Orchids.

"South Africa."—The great authority on South African affairs of 25th March, 1899, says:—"An interesting Catalogue reaches us from the East. It is issued by William Brothers, Tropical Seed Merchants, of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbing. We recommend the great Powers and Concessionaries under them to go to William Brothers."

A leading Planter writes from *New Hebrides* under date 17th January, 1899:—"I shall like a few more of your Catalogues to distribute through these Islands, as I feel sure many would place themselves in communication with you, did they know where to write for Seeds and Plants."

Our New Descriptive Price Lists of Seeds of Shade Trees for Coffee, Cacao, Tea, Cardamoms, &c., Timber Trees, Trees for Avenues, Hedges Wind and Shelter Belts, Ornamental Trees, Shrubs and Climbing Plants; and Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons and Dracinas, now being prepared and will be ready shortly.

Agents in London:—Messrs. P. W. WOOLLEY & Co., 33, Basinghall Street.

Agent in Colombo, Ceylon:—E. B. CREASY, Esq.

Telegraphic Address:
William, Veyangoda, Ceylon.
Lieber's, A.I. and A.B.C. Codes used.

J. P. WILLIAM & BROTHERS,
Tropical Seed Merchants,
Henaratgoda, Ceylon.

UPPER MASKELIYA ESTATES CO., LTD.

ANNUAL REPORT.

ACREAGE 31ST DECEMBER, 1899.

	Brunswick and Bloomfield.	Caskieben.	Total.
Tea in full bearing	446	200	646
Do not bearing	—	7	7
Grass, Timber Trees, &c.	72	—	72
	518	207	725

The Directors now submit to the Shareholders the accounts of the Company for the past year.

The crop realized amounted to 329,814 lb. Tea (being 29,814 lb. Tea in excess of the estimate) against 256,032 lb. secured in 1898. The average price realized for all tea sold, including the grant of 10 cents per lb. on green teas, was 42·86 cents per lb. The expenditure in 1899 on capital account amounted to R3,242·96 for new lines, and for additions to machinery.

After writing off 10 per cent on original cost for depreciation of Buildings and Machinery and a sum of R50 for bad debts, the profit for the year amounted to R42,340·17 equal to 12·10 per cent on the capital of the Company. To this falls to be added R624·36 brought forward from 1898, and surplus of R742·95 over the estimated value of 12,020 lb. 1898 crop, making R43,707·48 available for dividend. An interim dividend of 3 per cent was paid on 2nd September last, and the Directors now recommend the payment of a final dividend of 5 per cent, making 8 per cent for the year, and that the balance of R15,707·48 be carried forward to the current season's account.

The crop for this year is estimated at 300,000 lb. tea on an expenditure of R91,305·05 which includes the sum of R12,033 for manuring 310 acres.

The attention of shareholders is drawn to the accompanying notice of an Extraordinary Meeting to be held, to pass, if approved, a resolution empowering the Directors to pay an interim dividend, which power is usually given to Directors and obviates the necessity of calling a General Meeting of the Shareholders solely for that purpose.

In terms of the Articles of Association Mr. A E Wright retires from the office of Director, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

THE COLOMBO TEA TRADERS' ASSOCIATION.

REPORT FOR THE YEAR ENDING 31ST DEC. 1899.

The Committee have pleasure in presenting their report for the year 1899.

From many estates the packages are still very indifferent, especially where local woods are used. Of these, experience shows that Kakuna, Mango, and Imbul are particularly unsuitable.

The outturn of weights is now more satisfactory than last year, but there must always be trouble in the trade in this respect after sampling, so long as estates which do not bulk their teas, simply put in the bare weight stencilled on each package.

The general opinion of buyers is that the outturn of machine packed teas is better than those packed in other ways.

The larger portion of tea sold locally is encouraging, and the quantity shipped to America and Russia is still increasing, as is evidenced by the comparative figures for 1898 and 1899 given below. So far as Russia is concerned, the demand is almost entirely for leaf teas.

The total exports for the year were, as per Chamber of Commerce returns.—

	1899.	1898.
United Kingdom	103,851,614	96,133,833
Australia	15,606,833	15,126,891
Russia	3,949,740	2,714,003
America	3,080,002	2,180,188
Other Countries	3,309,457	3,614,156
	129,797,646	119,769,07 1

The following figures show the quantity offered locally in public sale for the last four years, with the average price obtained for complete invoices sold.

	lbs.	Average. cents.
1896	32,083,163	41
1897	33,886,809	37
1898	35,958,819	35
1899	38,377,318	38

The following is the present Committee:—

THE CHAIRMAN OF THE CHAMBER OF COMMERCE.

BUYERS:—Messrs. Tarrant, Henderson & Co., F F Street, Darley, Butler & Co., and Finlay, Muir & Co.

SELLERS:—Messrs. Bosanquet & Co., Whittall & Co., J M Robertson & Co., and Geo. Steuart & Co.

The number of members belonging to the Association is 43, against 44 in the previous year.

The accounts for the past year made up to 31st December, 1899, and submitted to you shew a credit balance of R1,247·51.

BADULLA PLANTERS' ASSOCIATION.

ANNUAL REPORT.

Your Committee have much pleasure in submitting their annual report for the year 1899—the sixteenth since the formation of the Association.

During the year two Committee meetings and two general meetings have been held.

MEMBERSHIP.—Forty-seven estates and three private members are on the roll, being the same number as last year.

FINANCE.—The books of the Association are laid on the table for the inspection of members and show a balance of R156·29 at credit against a balance of R4·53 at the end of the previous year.

ESTIMATE OF TEA CROP, 1900.—The estimated tea crop from the district is 4,683,150 lb. as against 4,516,090 lb. in 1899—an increase of 167,060 lb. The total acrage in tea is 15,784 acres of which 11,821 acres are in bearing and 3,963 acres young tea. This shows an estimated yield for tea in bearing of 396 lb. per acre.

TEA.—The season was not a favourable one for tea. The rainfall being short and badly distributed throughout the year. Two periods of severe drought were experienced, viz., February and March and May to September. The latter was the most severe drought experienced for many years. Owing to these abnormal climatic conditions the estimates framed for 1899 were not realized on many estates.

COFFEE.—Fortunately the district is not dependent on this product now. Good crops were harvested on a few estates during the past year, but prices have fallen very low and green bug continues its ravages so that the prospects of this product are far from good.

MINOR PRODUCTS.—Cacao and cardamoms continue to be cultivated in the district. The latter product is being extended considerably.

MAIN ROADS AND BRIDGES.—Your Committee have pleasure in reporting that the improved conditions of the main roads mentioned in their last annual report has been maintained. Your Committee congratulate you on the completion of the extension of the Madulsima cart road to Cocogalla Factory: also on the completion of the very handsome cart bridge over the Badulla Oya at Taldena. Both these important works have been carefully designed and thoroughly well-constructed and will be of great benefit to the general public and to the estates they are intended to serve. Great credit is due to Mr. Christie, the Provincial Engineer, and his staff, for the highly satisfactory state of public works throughout the district. It may well and truly be said that never before have the roads in Uva been in such excellent order as at the present time.

NEW WORKS.—Your Committee are pleased to be able to announce that in response to a resolution passed at the last general meeting of this Association, His Excellency the Governor has ordered that provision for a bridge over the Badulla Oya on the

Badulla-Namunakula minor road be included in the estimates for 1901.

Your Committee trust that the extension of the important road from Taldena to Alutnuwara *via* Bubule will be undertaken at an early date and a cart bridge built over the dangerous Loggaloya, thus completing this most important and necessary link of connection with the lower portion of the Province.

MINOR ROADS have been maintained in a satisfactory condition throughout the year. The Chairman of the Provincial Road Committee addressed this Association with a view of reducing the number of minor roads in the district, but after full and careful consideration of this matter it was resolved that no reduction of these important lines of communication could be recommended at present.

AGRICULTURAL CHEMIST.—Mr. Kelway Bamber paid two visits to the district during the year. Members of the Association had an opportunity of meeting that gentleman on both occasions and were able to elicit a good deal of important information in connection with tea manufacture, &c., and your Committee look forward with interest to the receipt of Mr. Bamber's report which will doubtless contain much valuable information relative to our chief industry. The thanks of the Association are due to H.E. the Governor for the appointment of a Mycologist.

LABOUR.—The labour supply has been fairly good during the year, but there are indications that demand has overtaken supply and your Committee view with some apprehension the increased demand that must necessarily arise when the construction of the lines of Railway to the North and to Udapussellawa is begun. Your Committee earnestly trust that Government will take steps to recruit from outside the island all labour required for railway construction.

RAILWAY EXTENSION.—Your Committee regret that no progress has been made in the matter of railway extension during the year, but sincerely trust that the construction of a light line from Bandarawela as far as Passara will be undertaken before many years have passed.

BENEVOLENT FUND.—Your Committee regret that hitherto this fund has not received from members the support it deserves. They, however, trust that every member of the Association will become a subscriber to this most important fund during 1900.

IN CONCLUSION your Committee would earnestly impress upon every member of the Association, the necessity for continued efforts being made to obtain such reforms and improvements as may be of lasting benefit to the district.

THE KALUTARA COMPANY, LIMITED.

ANNUAL REPORT,

ACREAGE.

Tea in bearing	518 acres
Tea in partial bearing	140 do
Arecanuts, Grass, Ravines, &c.	10 do
	668 do
Forest	416 do
Total	1,084 do

The Directors now submit to the Shareholders the accounts of the Company for the past year.

The crop secured was 305,433 lb. Tea against an estimate of 285,000 lb. while 5,833 lb. Tea was manufactured from purchased leaf. The average nett price realized was 36·89 cents per lb. against 33·08 cents per lb. in 1898. The expenditure on the estate amounted to 22·93 cents per lb. which included a sum of R5,347·27 for manuring.

The Rubber trees are growing satisfactorily and the supplies which were found necessary owing to damage by cattle are coming on well. Sinhalese are still prospecting for plumbago, but no definite arrangements have yet been made for working it.

After making full provision for depreciation of Buildings and Machinery, writing off a sum of R1,000 to Coast Advance Reserve Account and paying the interest on the Preference Shares, there remains a balance at credit of Profit and Loss Account on the year's working of R30,147·13, equal to 7·54 per cent on the capital of the Company. To this falls to be added the balance of R3,774·66 brought forward from 1898. During the year under review a further 20 of the Preference Shares were issued, making the total Preferential capital R27,500.

On 28th August last an interim dividend of 2 per cent was declared and the Directors now recommend the payment of a final dividend of 5 per cent, making 7 per cent for the year, and that the balance of R5,921·79 be carried forward to the current season's account.

The capital expenditure for the past year amounted to R10,981·38 on the upkeep of young tea not in bearing and additions to Buildings, including the final payments on account of Withering House.

The estimate of crop for this year from the Company's estates is 333,000 lb. Tea on an expenditure of R75,532·65, including the sum of R5,756 to be spent on manuring, while expenditure on Capital Account is estimated at R6,268·75, for the planting up of 25 acres with Tea and the erection of new lines which are much required.

During the year Mr. J G Wardrop resigned his seat on the Board and the remaining Directors appointed Mr. R S Templer in his place. On Mr. W H Figg's departure from the island Mr. Wardrop was re-appointed. In terms of the Articles of Association Mr. G H Alston now retires from the Board, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

THE RUANWELLA TEA COY., LTD.

ANNUAL REPORT.

ACREAGE.

Tea in full bearing	358 acres
Tea not bearing	16 „
Jungle and Wasteland	199 „
Total	573 acres

The Directors have now to submit to the Shareholders the Accounts of the Company for the past year.

The crop secured amounted to only 161,100 lb. Tea against an estimate of 200,000lb. The shortfall is mainly due to the deficiency in rainfall.

The average net price realized was 34·66 cents per lb against 30·90 cents per lb in 1898; the cost delivered in Colombo was 26·58 cents per lb, [which includes the cost of manuring, amounting to 2·22 cents per lb. This high cost per pound is attributable to the small crop.

In view of the fact that the balance at credit of Depreciation Account now represents about forty per cent of the original cost of Buildings and Machinery the Directors do not consider it necessary to write off anything further for depreciation at present.

After transferring the sum of R500 to Coast Advance Reserve Account and writing off a bad debt of R73·67, the profit for the year amounted to R10,543·01, to which falls to be added the balance brought forward from 1898, R1,381·26 and a surplus of R661·46 over the estimated value of 16,690 lb. of 1898 crop. The total available for distribution is therefore R12,585·73, and the Directors recommend that a dividend of three per cent be declared for the past year, and of the balance of R4,635·73 carried forward to the current season's accounts.

The estimated crop for 1900 is 180,000 lb tea on an expenditure of R41,763·93, which includes a sum of R3,616·84 for manuring.

During the year Mr. W H Figg resigned his seat on the Board, and the remaining Directors appointed Mr. G H Alston to the vacancy, who now retires, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

HIGH FORESTS ESTATES CO, LTD.

ANNUAL REPORT.

ACREAGE.

Tea in bearing ..		..	588 Acres
Do in partial bearing		..	246 do
Do do	1897	..	174 do
Do do	1898	..	132 do
Do do	1899	..	25 do
			1,165
Forest and Patna		..	467 do
			1,632 Acres

The Directors now snbmit to the Shareholders the Accounts of the Company for the past year.

The total crop secured during the year under review was 258,496 lh. tea (heing 28,496lb. in excess of estimate) which realizcd a nett average of 50·06 ceuts per lh., compared with 50·76 cents per lb. in 1898. This price may be considered very satisfactory in view of the lower prices which prevailed for good teas during the year.

After making the usual provision for depreciation of Buildings and Machinery and writing off R1,840 which was expended on a snrvey of a route to Padiapalella in 1897-1898, the year's working shews a profit of R53,564·10, equal to 5·79 per cent on the capital of the Company. To this has to he added the halance of R3,560·47 brought forward from 1898. An interim dividend of two per cent was paid on 28th August 1899, and the Directors now recommend the payment of a final dividend of three per cent, making five per cent for the year, which will leave a balance of R10,874·57 to be carried forward to the current year's working.

During 1899 in addition to the capital expenditure referred to in last year's report, the Directors considered it advisahle to start the erection of a new withering house, so that it might he completed in time to accommodate the iucreased quantity of leaf anticipated from March next onwards. The withering house is practically now completed, and it is anticipated will provide the necessary acoommodation required for the increased returns from young tea for the next four years. The total expenditure on capital account amounted to R36,847·80, which included the npkeep of 552 acres not then in bearing and the opening up of a further 25 acres. During 1900 the expenditure on upkeep of young tea and the opening of a further 15 acres is estimated to amount to R15,339, while the erection of new lines and the completion of withering house and the cost of additional machinery will probably entail the expenditure of R7,300. The Directors do not anticipate having to make any further call on the holders of the part paid shares nntil January 1901, when funds will be required to cover the capital expenditure referred to above.

Little progress has been made in the negociations for improvement of transport arrangements, but, in view of the Uda-Pussellawa light railway having been sanctioned by the Secretary of State, efforts are now being made to obtain access to that line.

The yield of Tea in 1900 is estimated at 300,000 lh. on an expenditnre of R80,789·76.

During the year Mr. E J Young resigned his seat on the Board, and the remaining Directors elected Mr. W J Smith to the vacancy. In terms of the Articles of Association Mr. J G Wardrop now resigns his seat on the Board, but is eligible for re-election.

The appointment of an Auditor will rest with the meeting.

MAHA UVA ESTATES COMPANY, LTD

ANNUAL REPORT.

ACREAGE.

Tea in full bearing	..	598 Acres
„ in partial bearing	..	12
„ not in bearing	..	8
Cardamoms	..	89
Grass and Fuel	..	24
Total cultivated	..	731
Jungle and waste land, &c.		227
Total of Estate	..	958

The Directors now submit to the Shareholder the accounts of the Company for the past year.

The Tea crop secured, including tea made from 1,744 lh. purchased leaf amounted to 235,916 lb. (or an excess over estimate of 5,916 lb.) while the expenditure was less than that estimated.

The cardamon crop did not quite come up to expectations, and coffee crop amounted to 127 bns., but quality was very poor. The nett average prices realized for the tea and cardamons sold to date were 39·83 cents and R1·58 per lh, respectively; these prices compare with 42 cents and R1·71 per lb. obtained for 1898 crops.

After making the usual provision for depreciation of Buildings and Machinery, the amount at credit of Profit and Loss Account for the year's working was R25,944·14, equal to 8·65 per cent on the capital of the Company. From the balance of R6,595·39 brought forward from 1898 there falls to be deducted the sum of R28 74, being amount overestimated for value of 466 lb. Cardamoms unsold at the end of 1898. The total amount available for distribution is therefore R32,510·79. Out of this an interim dividend of 3 per cent was paid on 2nd September last absorbing R9,000 and the Directors now recommend the payment of a final dividend of 5 per cent, making 8 per cent for the year, and that the balance of R8,510 79 be carried forward to the current year's account.

The estimates for this year are 244,050 lb. Tea and 6,000 lb. Cardamoms on an expenditure on the estate of R66.817·71, on which however it is hoped a considerable saving may be made if circnmstances are favourable, while R1,150 will be expended on Capital Account in roofing with iron two sets of lines.

The attention of shareholders is called to the enclosed notice of an Extraordinary General Meeting, at which it is proposed to alter the Articles of Association to empower the Directors to declare interim dividends without the sanction of a Geueral Meeting.

During the year Mr. E J Young resigned his seat on the Board, and the remaining Directors nominated to the vacancy Mr. W J Smith, who now retires from the Board in accordance with the Articles of Association, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

CEYLON FISHING CLUB.

REPORT ON THE LAST CONSIGNMENT OF BROWN TROUT OVA RECEIVED.

The Ova in the first layer of the box were fonud to be in good condition, only five to eight per cent were bad. This is a very good percentage. In the second layer the ova of one side of the layer had to be entirely thrown away as they were quite spoilt and about two-thirds of the other half were used. In the third layer about one-half had to be thrown away and from the other half only about one-third were put out, bnt these were badly affected with fungus.

This is one of the worst lots we have received, but there was one other lot which was worse or about the same.

The causes for this may, I think, be attribnted to the following: (1) Was the ice receptacle kept continually replenished during the voyage? When I took the hox into the boat, I found that there was a little ice in the receptacle, not enough for the ova, and I immediately put in some more ice.

The boatman who preceded me to the cool room told me that when he went there he found that the ice was just being put in the box.

(2) In the hottom of the box we found that the water which flows from the ice does not flow off rapidly as there is only one hole in the centre of the box and this hole was slightly higher than the level of the bottom of the box. The water could easily contaminate the last layer and it will in turn affect the layers above.

The layers are too long and I think that the weight of the layer presses on the layer beneath and thus crushes the eggs. Most of the eggs were found to be in masses closely joined together and completely spoilt. I think this is to a great extent caused by the weight of the layers above. The layers rest one above the other and when they are fairly heavy press on to the ova in the layer beneath. The rims of the layers are too narrow. The old large boxes had square layers with broad rims and it was impossible for one layer to crush the layer beneath. In case they cannot alter the defect it is advisable to revert to the former boxes as a very large percentage of the ova is crushed by this means.

THE OUTTURN.

The outturn of ova has been very low: only 450 alevins hatched out altogether, out of which 257 died and there are at present only 193 alevins. From the first layer 280 alevins hatched out and from the second layer 170 alevins hatched out. No alevins hatched out from the third layer.

The outturn from the top layers in the consignment for 1899, *i.e.*, since the new boxes were used, were also very unsatisfactory. The death rate has also been very high

Mr. Elhart then refers to appendix C., page15 of the report for 1899, also drawing attention to the fact therein mentioned that the top layers did not hatch out.

PLANTING NOTES.

MESSRS. LIPTON, LTD., have secured the contract for the supply of 10,000 lb. of tea through the Ceylon Court Paris Exhibition for use in cup. There were eight tenders, we understand, and the samples were put to severe and repeated tests, and that of the Company named came out first on each occasion.—*British Trade Journal*, Feb. 1.

JAMES FRASER.—In all probability the father of Scotch gardeners has passed away in the person of the late Mr. James Fraser, gardener, who died at Castlehill, Turriff, on the 18th ult., aged ninety-eight years. Mr. Fraser was engaged by the late Dr. Adam, as gardener at Ardmiddle House, Turriff, in the year of the disruption, 1843, and for the long period of thirty-three years he conducted gardening operations at Ardmiddle with great acceptance by his employers.—*Gardeners' Chronicle*, Feb. 3.

THE PETROLEUM TRADE.—On page 613 we give an interesting statement, supplied by Messrs. Delmege, Forsyth and Company, regarding the present position of the world's supply of petroleum. Statistics are offered of the output from America and Russia during the past three years and the course of prices is also shown. All point to an increasing scarcity of the popular oil and consequently to a rise in prices which the poor must feel a good deal in what has now become so indispensable an article in every household.

THE SEASON OUTLOOK IN MADRAS.—The following is the Board of Revenue's telegraphic summary for the week ending the 17th February:—"No rain. Water-supplies are diminishing and generally deficient. Unless protected by irrigation standing crops are deteriorating. Harvest continues to yield indifferent outturn. Pasturage is scanty everywhere, but fodder is generally sufficient and cattle is normal. Prices continue almost unaltered. Four test works in Cuddapah attracted 917 men, 1,551 women and 688 children, total 1,156; also advances given to 350 looms employing 864 men and 668 women weavers."—*Madras Mail.*

BANANAS IN QUEENSLAND.—Brisbane, Feb. 5:—Banana growers in the Cairns district, who are almost exclusively Chinese, recently offered to pay the wages of an Inspector to overhaul their fruit before it left for southern markets, owing to the danger of a cessation of the trade, on account of the number of diseased bananas leaving the colony. This arrangement proved so satisfactory that they have since offered to pay the wages of a second Inspector. The Chinese have also bound themselves to pay a fine to the Josshouse of 1s per bunch for all fruit found infected, and, should this occur frequently, to accept the refusal of the Inspector to pass any fruit from that garden.—*Adelaide Observer.*

INDIAN AND CEYLON ROADS.—Our old friend Dr. Workman, has been writing in "Travel" for February, on "the adaptability of Indian Roads to Cycle Touring." There is one paragraph complimentary to Ceylon worth noting:—

So far as the cyclist is concerned, I should class Indian roads as fair-weather roads. Such as they are, good, indifferent, and bad, he can get over them during the dry season, but I have seen very few roads that apparently could be used for cycling during the monsoon rains. In respect of construction the roads of Ceylon are far superior to those of India, the metalling being more thoroughly done. I was able to ride many hundreds of miles in Ceylon during the monsoon, being frequently overtaken by drenching tropical showers, which flooded the roads, without being detained an hour for them to dry.

THE RAINFALL OF 1899.—The aggregate rainfall during the year just closed was deficient over the whole of England, the deficiency amounting to 6 inches in the Channel Islands, 5 inches in the south of England, and 4 inches in the east and south-west of England. There was a slight excess in most parts of Scotland and Ireland. The mean temperature for the year was in excess of the average over the whole area of the British Islands, the excess being greatest over the southern portion of the kingdom, although it was also very large in the north of Scotland. There was an excess of sunshine over the entire country, amounting to about 350 hours in the south of England, and exceeding 200 hours over the whole of England, except in the north-eastern district. In Ireland the excess was about 150 hours; but in parts of Scotland it was not so large.—*Gardeners' Chronicle*, Feb. 3.

COCOA MACHINE WANTED.—What is most needed, says the United States Consul at Asuncion, in reporting on the Cocoa Trade of Paraguay, is a machine which can remove the pulp and break the hulls of the fruit without cracking the kernel. A number of machines have been invented for this purpose, but as yet none has given satisfactory results. The Agricultural Bank has tried a French apparatus, but the cost is too great to enable it to be generally adopted. In one part of the apparatus the pulp is removed from the boll and this is then passed to another part, where there are three cylinders—one with grooves to hold the cleaned hull, another with longitudinal knife-like projections, and the third with transverse projections. This machine costs about $850. What is desired here is a machine costing, say, $35. It must be remembered in building a machine that some of the bolls are large and others small. The kernel, when cracked, becomes unfit for the market.—*British Trade Journal*, Feb. 1.

A SYNDICATE of London capitalists have sent out Messrs. Swinney and Bird, who have previously made considerable explorations in Pahang, with a view of obtaining land for mining purposes. These gentlemen have applied for concessions in more than one district of that State. They are also trying to obtain land in the independent State of Kelantan.—*PerakPioneer*, Feb. 14.

FARMING IN THE TRANSVAAL.—Says the *Sydney Mail*:—It is popularly supposed in Australia that the Transvaal and adjacent territories will offer a wide and profitable field for the exertions of enterprising men after the war is over. In some respects this supposition will doubtless be realised. But we must not forget that so far as business was concerned, there were better opportunities for pushing men in Johannesburg than in any other part of the world before the war. Also, wages of good, willing men were very high, and the average earnings of the white population were such as would be considered sumptuous even by Australians, Competition will probably be keen when the war is ended, and it is doubtful indeed if the commercial opportunities of the man without the capital will be as great as before. In another direction there may be good openings for experienced agriculturists. There are sound local markets, and Boer methods are not advanced. For the matter of that, there are not so many advanced farmers in Australia that we can afford a trek to Boerland. The Boer may be a ragged farmer, but he probably works on very cheap lines, and cheap production, however slovenly it may be, is a tough opponent. These are points that could be considered with advantage by Australian settlers later on.

INDIA-RUBBER (MEXICO) (LIMITED).—A meeting of shareholders was held yesterday at Winchester-house to consider what conserted action should be taken to recover the money invested by them in the company. The Chairman entered at considerable length into the position of the company since its incorporation in 1897. He reminded them that the prospectus estimated that the profits for the first year's working would be £70,000, and in the second and third year £80,000 and £120,000 respectively. The fact that during those three years only £275 had been derived from the estates in Mexico seemed to show that there was no foundation for such statements. At the recent action against Mr. Clough at Leeds Assizes the jury found that the statements contained in the prospectus were untrue, and that the defendant had no reasonable ground for believing them to be true in fact. The jury further found that Mr. Clough had been guilty of false and fraudulent representation to the plaintiff. In fairness he had to state that Mr. Clough was prosecuting an appeal, the hearing of which might possibly come on within the next six months. Replying to a question, the chairman said that there were 961 shareholders, representing 80,000 shares. Mr. Burton asked if the persons responsible for the prospectus were possessed of adequate means to recoup the shareholders. The chairman said that there was evidence that they were men of ample means. Eventually, on the motion of Mr. J Hess, seconded by Mr. Horner, a resolution was passed appointing a committee to co-operate with that elected at the Newcastle meeting, to consult with Messrs. Simpson and Simpson, and counsel, if necessary, as to the best way of enforcing liability against the directors, or others, responsible for the prospectus. —London *Times*, Jan. 20.

JAMAICA TOBACCO.—At Montpelier, the property of the Hon. Evelyn Ellis, an extensive factory for the manufacture of cigars is now in full working, the entire cigar being the product of Jamaica soil. Mr. Ellis has planted out sixty acres exclusively with seedlings of the famous Vuelta Abajo tobacco, obtained from the Botanical Department. The tobacco, cured on the spot, realized high prices in New York.—*British Trade Journal*, Feb. 1.

THE ADVANCE IN RUBBER.—A correction, which arrived too late for insertion, in the advertisement of Messrs. Lynch and Co., (Ltd.), Aldersgate Street, E.C., in last week's issue, slightly alters the reading in reference to india-rubber water-bottles. Instead of "No advance" being made in the price of these articles an advance of five per cent should have been notified. This is occasioned by the increase in cost of the raw material, but Messrs. Lynch intimate that no uniform advance will be made. Each article will be dealt with on its own merits, and they will make reductions and revert to old prices as soon as opportunity arises.—*Chemist and Druggist*, Feb. 3.

QUEENSLAND: DEPARTMENT OF AGRICULTURE. —A great deal of useful information is contained in the Annual Report of this Department, just received. Meantime we quote what is said in the chief report about our old staple :—

COFFEE.—Though this, like rice, is grown upon the coast side of the main range from Cooktown to the Tweed Heads, the tendency is towards cultivation in the tropics, where plantations are now being cultivated upon a commercial scale. It has only been within the last three years that the interest shown in this product has demanded the attention of the Registrar-General from a statistical point of view, but from that time the increase in area has each year shown a fair advance. Taking the last two years for an example, it will be found that in 1897 there were 180¼ acres of productive coffee trees and 130¾ of non-productive, and in 1898, 199 acres and 233 acres respectively. The figures show an evident advance in the area planted, and the information to hand points to the statistics of the present year being yet more favourable. The imports for 1898 were 170,886 lb., and upon that basis there is room for the use of 602 acres before we overtake our consumption, which, upon the present population of 498,523, is at the rate of ·456 lb. of coffee per head each year. The market in Europe, however, is good, and though we may not yet have learned how to offer our goods in the most attractive manner, the opinion expressed by the trade in London upon Queensland coffee is very favourable, and by the time we are in a position to place a fair quantity for export that method of preparing our coffee will have been attained, and we shall be able to compete with those countries wherein coffee-growing has been prosecuted for centuries. The appointment of Mr. Newport as instructor in coffee culture has given an impetus to this branch of tropical agriculture, and as he has also an intimate knowledge of what may be termed allied products, such as spices, the benefits to the farmers of the North will be greater than was anticipated. The death of Mr. E. Cowley, and the exigencies of the Diseases in Plants Act at Cairns has precluded Mr. Newport, up to the present, from giving that attention to instruction he would have wished, for the reason that he was retained in Cairns to supervise the nursery, and to attend to the inspection of fruit. Arrangements have, however, now been made to release him from that detention, and his services will henceforth be at the command of the coffee-grower. A report from him upon this subject is attached herewith.

THE PETROLEUM TRADE.

(Special Report.)

The year 1899 has been one of great revulion in the Petroleum trade, prices having shown very material advance, owing mainly to the many new and large uses which have been found or Petroleum products. Among these, Liquid Fuel for use outside of oil-producing countries s a large factor, while it must not be forgotten hat the falling-off in the supplies of the Langkat Company's oil has created a void in the east which the production, certainly not increasing, in Russia and America, has found it difficult to fill.

AMERICAN.—The production of Crude Petroleum n America for the last three years has been as follows:—

1897	2,132,759,000	Imperial gallons,
1898	2,111,034,000	" "
1899	2,058,656,000	" "

The Exports were as follows:—

1897	975,515,000	Imperial gallons
1898	1,034,250,000	" "
1899	1,082,345,000	" "

That the Americans have exported to the utmost possible, in view of the improved prices, is evident from the following table:—

Remaining for home consumption per head of the population:

in 1897	18·16	Imperial Gallons
1898	16·92	" "
1899	14·00	" "

LANGKAT.—The supplies of illuminating oil from this source which, during 1898, reached approximately 5,000,000 cases, and which were expected to reach during 1899 nearly double that quantity of have, during the year, fallen off to such an extent that the monthly p oduction during the second half of the year averaged from 150,000 down to 120,000 cases, and today does not exceed the rate of 120,000 cases per month—thus leaving a large void to be filled.

RUSSIA.—The production of Crude Oil in Russia during the last three years was as follows:—

1897	1,883,810,000	Imperial Gallons
1898	2,216,700,000	" "
1899	2,307,957,000	" "

It must be borne in mind that the fast growing increase of demand for Liquid Fuel in Russia has absorbed a very large proportion of the increase, while the production at Baku is immaterial, seeing that the transport facilities by rail from Baku to Batoum are extremely limited, and during the year were more so than usual owing to the removal of a very large number of waggons by the Government Railway Authorities for purposes of repair. A larger number than usual of interruptions in the Railway were also experienced, while the increasing favour in which Russian Oil is held in Europe, and the consequently increased demand for it, have made a call for a larger proportion of the Oil received in Batoum than usual.

The total exports from Black Sea ports of Russian Oils, including Crude, Refined and Residnum during the past three years, have been as follows:—

1897	57,100,000	Poods
1898	68,701,000	"
1899	69,738,000	"

(N. B.—One Pood equals approximately 4·378 Imp: Gallons of Refined Oil).

In Russia, as also in America, although the high level of prices reached has stimulated boring to a large extent, nevertheless production has not been materially increased, as it is stated that by boring their Wells too close together, a new Well robs older ones of their production, and this is evidenced by the reduction in the number of new spouting wells in Russia.

VALUES.—The values in America have been as follows:—

For Crude oil	Jan. and Feb.	1899	$ 1·15	per Barrel.
	March to June	1899	1·15	do
	July	1899	1·21	do
	August	1899	1·27	do
	September	1899	1·43	do
	November	189	1·58	do
	December	1899	1·66	do
	January	1900	1·68	do

In Russia values of Refined oil per Pood were as follows:—

Free on Rail, Baku:—

January 1899	23½	Copecks per Pood.
February	22½	do
March to April	16½	do
May	19⅜	do
June to July	22⅝	do
August	25¾	do
September	24 9-16	do
October	30	do
November	38 11-16	do
December	47½	do
January 1900	55	do

In addition to this continuous but fast increase in values, has to be reckoned an increase in the Railway Tariff from Baku to Batoum of four Copecks, viz; from 12 Copecks to 16 Copecks per Pood, while the premium on waggons paid in Baku has gone from 3 to 18 Copecks per pood, thus bringing practically home the shortage of waggons and transport facilities.

Prices of Russian case oil have increased from 2s 7½d to 2s 8d in April to May up to 4s 4d at the end of the year—the last being a purely nominal quotation, as there were no sellers.

Today's parity for Bulk Oil is 4s 8d per case.

The same position continues today, although quotations are considerably higher.

American case oil has steadily increased in value from 5 cents per American gallon in January to 11 cents in December.

OTHER SOURCES OF SUPPLY.—Although other sources of supply than Russian and American were eagerly sought for during 1899, none came to such an advanced state that exports of Refined oil were made. The value of the Roumanian fields is very doubtful, but even if the value should turn out to be considerable, the geographical position is not favourable, and a very large cost would have to be incurred, and avery long time occupied, before the oil could be got to the sea-shore.

Borneo has made giant strides, but the difficulties encountered owing to the nature of the country and the climatic conditions have postponed the actual shipment of Refined oil, but the first cargo is expected to be available this month.

It will be seen, therefore, that while production in America and Russia has been practically at a standstill, there has been no production elsewhere to make up for:—

(1). The larger demand for Petroleum owing to its utilisation for fresh purposes; and (2) the material falling-off in the production in Sumatra. The obvious result was, therefore, an increase in values, which has been very material, and which has checked somewhat the extended use in Asiatic countries of Kerosene, so that the increased demand for Kerosene for native consumption in the Far East which has steadily been experienced during the last ten years, was not continued during 1899—which was felt to be a relief by all connected with the Petroleum trade, as it would only have increased the difficulties which were experienced during that year by all connected with the trade in supplying the demand.

COORG IN 1889-99:

COFFEE RAPIDLY DECLINING IN AREA: INDEBTEDNESS INCREASING.

WE have just received a copy of Report on the Administration of Coorg for the year 1898-99, which shows that the once favourite coffee district of Southern India is fast entering on "the sere and yellow leaf" stage for that staple. Once on a time, when the worthy Highlander, Donald Stewart, was regarded as "King of Coorg," no coffee district was more prosperous. From the detailed Report we quote as follows:—

COFFEE.—The total area of coffee land was 1,04,545 acres against 1,08,611 acres in the previous year. As explained last year this area includes a great extent of land which, though originally under coffee, is now allowed to remain waste by its owners as not suited for coffee. It also contains a considerable extent of Cardamom lands. Many of these waste lands, however, have been resigned by their holders during the year, the depression in coffee rendering them less saleable than before: hence the falling off in the acreage.

The area of assessed coffee lands held by European and native owners respectively is as follows:—

	No.	Acres.
European Estates ...	378	32,612
Native ,, ...	14,639	71,933
Total ...	15,017	1,04,545

COFFEE.—The coffee crop during the year was 4,558 tons against 2,500 tons in 1897-98. Although the crop was satisfactory in quantity, it, for some unknown reason, turned out to be, as a rule, poor in quality. Owing to this and to a glut of coffee in the market caused by large supplies from Brazil, wretched prices have been obtained and the industry is in a very depressed state.

TEA.—The tea planted in the Sampaji Ghant was not very successful, perhaps owing to the operations being somewhat hurried. Planting is being continued this year with every prospect of greater success.

CINCHONA.—The planting of cinchona has ceased in Coorg. There is a chance, should the present prices continue, of attention being again turned to this cultivation. An application was received for the right to bark some trees on one of the abandoned estates. The right was put up to auction, but only the small offer of R100 received.

Then the Commissioner makes the following remarks:—

The year's harvest was good, but prices ruled low. The coffee crop was also good; 4,558 tons against an average of 3,200 tons. Unfortunately the prices realized have been very disappointing, especially for the poorer sorts, owing to the home market being over tasked by Brazil coffee, and in spite of the good crop the industry is seriously depressed. In Padinalknad, where the coffee crop was bad and coffee itself threatens to die out, with the sanction of the Chief Commissioner, the postponement of half the assessment has been allowed.

It is trusted that the figures given above will not lead Government to believe that Coorg is at present a most prosperous Province. For such is unfortunately not the case. One may try not to take too gloomy a view of the prospects of the Province, but it is impossible not to feel that there is cause for grave anxiety. The Coorgs have been living for the last 20 years on borrowed capital. They have fallen into lazy and extravagant habits, as they themselves admit. They have borrowed on their lands, till they are hopelessly in debt, and cannot raise any more money even at 50% interest. Their families are increasing, but the nature of the country is such that the area of cultivation cannot be increased in proportion. The threatened failure of the coffee industry owing to the competition of the Brazils will also, if it continues, mean poverty to many a hitherto well-to-do Coorg family. The Coorgs are getting poorer and poorer and consequently discontented, and of course they blame Government, not themselves, for all their difficulties. There has been some talk of raising a Coorg Regiment. This is a project which, if carried out, will do good by affording employment to the young Coorg, who now too frequently does nothing but loaf round the toddy shops. But what is really required is some scheme by which the ryot could be given a chance of getting out of debt. At present he is hopeless and consequently reckless.

And on this the Chief Commissioner, Lieut.-Col. Donald Robertson, C.S.I., writes as follows:—

I am afraid we may look in vain for an agricultural revival in Coorg. Not only has there been no improvement since the termination of the period now being reported on, but the general depression may be said to have deepened; for though there will, it is confidently expected, be no famine, the rice crop has suffered in various parts and failed altogether in a few villages, whilst those coffee estate-holders who have been fortunate enough to secure moderate crops, are confronted with a discouraging outlook in respect to prices obtainable in England. Additionally coffee has entirely gone out, once flourishing gardens in large tracts in the West of Coorg containing now nothing but bare poles, and it is only the remarkable tenacity with which the Coorgs stick to their land, even though it may be commercially valueless, which prevents a large decrease in the land revenue demand. I confess that I am not hopeful that it will be possible to adopt immediately any remedial measures for removing the burden of indebtedness. The necessary reform should, moreover, originate amongst the Coorgs themselves. Their country has been pauperized by the introduction of such a ready means of becoming rich as presented itself some years ago in the cultivation of coffee, with the higher style of living which unfortunately resulted, and especially the facility for extensive borrowing which it afforded. It is now extremely difficult to obtain advances on coffee estates, and the Coorgs have nothing else to offer as security; if they mortgage their *sagu* rice lands (*jama* lands being inalienable) they cannot live. I carefully examined the very serious question of local indebtedness at my last visit to Coorg in February of this year, but was enabled to arrive at no satisfactory conclusion. The matter seems to be as yet hardly ripe for Government intervention nor is the situation so desperate as to call for extraordinary measures. There are, I believe, some signs that the Coorg character is slowly undergoing change in a recognition of the necessity for thrifty living and the abandonment of the foolish pride which has operated to prevent the people taking service, whilst it tolerated dissipation and laziness.

The case is one somewhat similar to that which occurred in Uva when coffee failed: the natives who owned coffee gardens were, for a time, hopeless and helpless. But by degrees they have come round and now find other products to growin their gardens.

RECEIVERS OF JAVA COFFEE in this city have been advised that the coming crops of that description of coffee are growing less satisfactory than heretofore, the flowering in many districts having been insufficient, so that not more than a small half crop for 1900 can be counted upon.—New York *Merchants' Review*, Dec. 1.

THE COFFEE INDUSTRY IN QUEENSLAND.

OPENINGS FOR PLANTERS.

Recent advices from Brisbane point to a marked development as a result of Government encouragement in the coffee trade of Queensland, and information is being circulated which should be of particular interest to small capitalists and others who may be considering the advisability of settling in the Colony, or of migrating from one part of the Empire to the other. The cost of the land would, we understand, vary considerably, according to the conditions under which it was taken up—as a homestead selection, agricultural, farm, or freehold land purchased outright. There is land open for selection all along the Queensland coast. The Brisbane Land Commissioner states that there were 50,000 acres of scrub land on the Blackall Range, within fifty miles of Brisbane, suitable for coffee or fruit growing, and open to selection at 2s 6d an acre as homestead leases to the first persons that came along. A few miles back from the coast at Mackay, Cairns, and other northern ports, freehold land may be purchased from 2*l* an acre upwards. Excellent sites, sheltered from the strong winds which prevail at certain periods of the year, can be chosen on the slopes of the coast hills, which, from their irregular conformation, are unsuitable for general agriculture, but which are all that could be desired for coffee culture. Should the site chosen be freehold land, it may be put down as a general average that 3*l* an acre would be the cost of purchase. The cost of cutting and burning off the scrub would not exceed 4*l* an acre. To grub out the heaviest stumps might take 3*l* or 4*l* more an acre, but this operation, to a man of limited means, is, to a certain extent, unnecessary, as the stumps may be allowed to rot away. Digging holes for the plants would increase the outlay by another 4*l*. The whole cost of preparing the plantation would be about 12*l* an acre. Taking, for instance, a plantation of thirty acres, the expenditure would be approximatley :—Cost of land, 90*l*; clearing (if heavily timbered) and planting, 360*l*; farming appliances, say 30; fencing, say 60*l*; total, 540*l*. There would be other contingent expenses, a dwelling-house, two horses and other items, the cost of which would depend largely on the settler's taste and disposition; and the expenses of living, keeping down weeds, and tending the young trees for three years, until they began to bear, would also have to be taken into consideration. Of course if he has been accustomed to manual labour, much of the above outlay would be avoidable with the help of one or two kanakas, or a couple of sons fit for field work. Opinions differ as to how many trees should be planted to the acre ; the estimates range from 700 to 1100. Experienced planters state that 1,000 are not too many where the soil is rich, the land well cleared, and economy of space has to be considered. At the end of three years the first berries appear, yielding approximately one-fourth of a full crop. In the fourth season about a half crop may be expected, and in the fifth year the trees are in full bearing. Each tree will yield 2 lb of parchment coffee, which means for 1,000 trees 2,000 lb of parchment. Taking the mean between the various estimated costs, it may be set down that the cost of picking will amount to ½d per lb of berry from the tree, or to 3d per lb of parchment coffee. During the past few years the selling price of the coffee locally has ranged from 7½d to 12d per lb. As importers pay about 9d per lb for inferior coffee from Fiji, it seems a fair average to estimate 9d as the ruling price of the local product, and at that figure European merchants have offered to buy Cairns and Mackay coffee in unlimited quantity. This would leave a balance of 6d per lb to the producer, which, at a yield of 2000 lb per acre, is 50*l*. Out of this return all incidental expenses would have to be deducted. Discounting all the estimates, disregarding the fact that growers in North Queensland have netted from 40*l* to 60*l* per acre, allowing for an increase in the expenditure, a fall in the price of coffee, and setting the net gain as low as 20*l* per acre, then the owner of a thirty acre plantation should find himself at the end of five years in receipt of an income of 600*l* a year.—*British Trade Journal*, Feb. 1.

MINOR PRODUCTS REPORT.

ANNATTO.—At the auctions good bright Ceylon seed brought 2d per lb, and another lot of 18 bags was bought in at 3½d. Privately, business a includes parcel of eight bags Ceylon seed at 2d per lb ex auctions of January 18th.

CINCHONA.—A parcel of 18 bales flat cultivated Calisaya bark catalogued for sale had been sold privately. Of Crowned and grey bark 62 packages were offered, and all sold at from 6¾d to 7d for fair brown Huanco quill, and 1s to 1s 1d for good Loxa.

COCA LEAVES.—Fair bright Ceylon leaves, the only kind offered sold at 1s 0½d per pound, and broken ditto at 7d.

EUCALYPTUS OIL.—In auction a parcel of four cases Citriodora, which had been previously offered, were held for 1s 4d per pound. Privately the market is somewhat quieter this week, with small sales at 1s 10d to 2s per pound for B. P. quality.

SPICES.—A good business has been done since our last report at steady to rather dearer prices. At auction on Wednesday the first arrivals of new crop Cochin ginger were offered, and sold at 32s per cwt for good boldish washed rough, slightly mouldy. New crop Calicut brown rough was bought in, a bid of 32s being refused; bold rough sold at 35s, and medium native cut, slightly wormy at 51s per cwt. There has been a good demand for Japan, and a fair quantity has been sold privately at 24s per owt. Bengal remains unchanged at 25s. Chillies are firm, a parcel of ordinary Zanzibar sold at 42s per cwt. A very nice lot of East India Capsicums, long red on stalk, sold at 39s 6d per cwt; some dark and mixed being bought in at 35s per cwt. Pimento sold at 3¼d per pound for ordinary to fair quality. Cinnamon Chips of good quality are scarce, and were held for 4d per pound. Pepper is dearer, Singapore black is offering at 6d per pound on the spot, and 6¼d for forward shipment. Tellicherry was bought in at 6¾d. Singapore white was bought in, but sales have been made privately at 8⅞d to 9 1-16d on the spot, and at 9¼d to arrive. There has been a good demand for Penang white at 8 9-16d, and 8⅝d is now wanted. —*Chemist and Druggist*, Feb. 3.

TROUT OVA FOR NUWARA ELIYA.

Another consignment of 10,000 trout ova of the brown species for the Ceylon Fishing Club was brought from England last month by the German mail steamer "Koenig Albert." The consignment was from the firms of Messrs. Andrews and Andrews of Guildford. Shortly after the vessel's arrival, Mr. Elhart went on board and took charge of the ova, proceeding to Nuwara Eliya by the same night mail train. The ova will be placed in the hatcheries and the results will be awaited with interest, the more so as the last lot got out was not so successful as it should have been.

A NEW RUBBER.

THE HANCORNIA OF ST. PAUL, BRAZIL.

(*Circular of Messrs. L. P. Barretto and Son, of Piritura, Saint Paul, specially translated.*)

The rubber furnished by the latex of these trees is a product of the first order equalled only by the *Hevea* of the Para.

In every respect, the Hancornia should be preferred for extensive culture. While the Heavea, like the Manihot Glaziovii, cannot go far from the tropics, under penalty of perishing, or of giving poor results, the Hancornia stretches from the equator to the 36th parallel South: it braves the tropical sun as well as the frost of our cold temperate zone.

The Hevea require soil rich in humus and in water. They have aquatic roots three quarters of the year. The Hancornia, on the contrary, require poor, dry soil: prolonged damp kills them.

Unfortunately, the germinative faculty of Hancornia seeds is very short: it fails after 12 or 15 days, and is impossible to send them to Europe. We have striven to find some means of conserving them.

Another difficulty has hitherto hindered the transport of these plants to other regions, namely the nature of the physiological *rôle* of their "sucker," an essential organ of nutrition during the first age. The least disturbance of this "pivot" or sucker during the first stages or in potting would kill the plants. But we have succeeded, after countless experiments, in overcoming this difficulty, and can deliver thousands of plants in Europe prepared and packed so that they can continue their journey to Africa or Asia. Three kinds are available: 1st, Hancornia speciosa, a kind known for some time, giving from 1 to 5 kilo per foot and per year. Good edible fruit; 2nd, Hancornia with a globular fruit, new, from the coldest zone of the State St. Paul, and giving from 5 to 10 kilo, good fruit. 3rd Hancornia with (pyriform) cone-shaped fruits (Hancornia Barrettoi, Nandin) recently discovered, from our warmest zone, rejoicing in soil neither too dry, nor too arid. It is the king of rubber trees giving up to 15 kilo of the finest rubber with one incision. Delicious fruit. Plants should be despatched between April and September.

THE ABYSSINIA BANANA MUSA ENSETE.

We are indebted to the Director of Kew for the photograph of a bunch of fruits of Musa Ensete. Flowering examples may now and then be seen in the houses at Kew. The bunch of fruits now figured was forwarded to Kew by a Covent Garden agent, who had received it from the Azores as a "peculiar Palm fruit, which might be obtained in quantity from that island." The diameter of the bunch was 12 inches. The fruits were not mature, consequently they did not contain the large seeds which this species generally produces abundantly. In this respect, and also in the fruit being coriaceousdry, and inedible, M. Ensete differs from the Banana proper, M. sapientum. The soft inside of the "stem" (really the folding bases of the leaves), is, according to the traveller Bruce the best of all vegetables. When boiled, it has the taste of the best new Wheat-bread not fully baked. Only the white "heart" of the stem is eaten; this is well boiled, eaten with milk or butter, and it is wholesome, nourishing, and easily digested. M. Ensete is a native of Abyssinia and equatorial Africa, but it is now widely distributed in the tropics. Young plants of it are used for summer effect in the London parks. According to the *Kew Bulletin*, the total weight of a single plant grown in the tropics is about a quarter of a ton.—*Gardeners' Chronicle*, Feb. 3.

PRODUCE AND PLANTING.

INFERIOR TEA CHESTS.—Grocers not infrequently complain of the bad condition of the tea chests they receive. This is a strong argument in favour of the use of patent tea chests. The grievance was made the subject of a resolution at the Grocers Association to be sent to tea importers. At a General Purposes Committee of the Federation of Grocers' Associations, held at Birmingham last week, Mr. Pitts proposed the following resolution on behalf of the Northampton Association: "That the members of this Association desire to bring before the General Purposes Committee the condition of tea chests as now used (more especially those containing Ceylon tea), green sappy wood being employed in their manufacture, thereby depreciating the value of the tea, and would urge upon the General Purposes Committee the desirability of making advances in the proper quarter with a view of obtaining a remedy." Since the matter was brought to his notice, he said he had made inquiries, and he found that there was a tendency to pack tea in chests made of green sappy wood. The grievance was due to unsuitable timber being used in the manufacture of the tea chests for the Indian and Ceylon plantations. The remedies suggested were that the planters must more carefully select and dry the timber from which they made the chests. The members of his own association were of opinion that there was just cause for serious complaint, as there was considerable loss sustained by the tea dealers and retailers. If this was a grievance then it was their duty to find a remedy for it. They might add to that another grievance—and that was in regard to charges for wrappers on chests and packages. They were charged at the rate of 1s for a chest, and 9d for half a chest, and he held it to be a most unjust charge. It did not cost the importers anything like that amount, and why they should want to make a profit out of the traders in that matter was unaccountable. For his own part he never paid these charges, and he always deducted half the charge, though some members paid the full amount. Mr. James seconded the resolution, remarking that Mr. Pitt's statement, that he only paid half the amount for the wrappers, was a lesson to him, because he always paid in full, and he certainly thought it a most exorbitant charge, and one that should be considerably reduced. Councillor Gower suggested, as a representative of a tinplate district, that Mr. Pitts should advocate the use of tin chests instead of wood. Mr. Jump said he had not personally had experience of any of the bad chests, but he had noticed that some of the Ceylon chests broke up very easily. The wood seemed to have contracted, and in some cases the tea was slightly damaged. He would suggest that they should bring the matter before the attention of the Indian and Ceylon tea importers in London, and he had no doubt that it would be productive of beneficial results. Mr. Pitts agreed that the resolution should be sent to the various associations of tea importers, and the resolution was carried unanimously.

THE VICEROY'S VISIT TO ASSAM.—If, as cabled from India, the Viceroy is to pay a visit to Assam next month it will be a historic occasion, no previous Viceroy having visited the province. His Excellency, it is said, is going right into the interior, to Gowhatty, for the purpose of seeing the actual condition of the tea plantations.—*H. & C. Mail*, Feb. 9.

TO TEST IVORY FOR GENUINENESS.

As ivory is extensively employed, and costs about six shillings per pound, it has been attempted to substitute a cheaper substance having the same appearance. For about forty years an article has been in use in this industry which has its origin in the vegetable kingdom, being derived from the nut of a palm-like shrub called Phytelephas macrocarpa, whose fruit has a very white

and exceedingly hard kernel, which can be worked like ivory. One hundred of these fruits only cost about four shillings. Their use for buttons and small articles offers great advantages, and the "ivory" can be passed off as the genuine article, the resemblance being so great that it is sold at the same price. It can be coloured also just like genuine ivory. M Pasquier, of Liege, now gives a practical method to distinguish the two varieties of ivory. It is the following:—Concentrated sulphuric acid applied to vegetable ivory will cause a pink colouring to appear in about ten to twelve minutes, which can be removed by washing with water. Applied to genuine ivory, this acid does not affect it in any manner.—*The Family Herald.*

THE TALGASWELA TEA CO. OF CEYLON. (LIMITED)

THE ANNUAL REPORT

The report of the directors was as follows:—

Approximate acreage of tea cultivated	..	516 acres.
Not weeded		
Cinnamon	.. .. ..	50 ,,
Forest, Chena, &c.	.. ..	1,473 ,,
	Total	2 039 ,,

ACREAGE.—In October last 210 acres were taken out of cultivation, upon the recommendation of the Visiting Agent, who reported that the bushes were stunted; and, owing to the large number of vacancies, the yield from this portion of the estate was inadequate as compared with the cost of upkeep and cultivation. This will effect economy in working, without, except very slightly, reducing returns. The area specified in tea is still however nominal, owing to the inclusion of swamps and ravines in acreage statement as retained in cultivation.

The Directors beg to lay before the Shareholders their Twelfth Annual Report with a duly audited statement of the Company's affairs on the 31st December, 1899.

Mr. R. Morison last visited the estate on the 30th and 31st December. His report is attached for the information of the shareholders.

The yield for the year was 148,902 lb. against and original estimate of 160,000 lb., and a revised estimate of 145,000 lb., dry weather being responsible for the shortage. It was all sold locally, at an average of 34·92 cents per lb., against an average of 34·71 cents for the preceding year. The demand for Ceylon teas in the local market during the year has, on the whole, been satisfactory, a very noticeable feature throughout having been the good prices made by teas of medium and lower quality.

The expenditure on manure was R4,363·11, equal to 02·74 per lb. of made tea, and was debited to revenue account. After paying for this and writing off the usual depreciation on buildings and machinery, the balance at the credit of profit and loss account is R4,070 96, which, in view of the heavy expenditure on manure recommended by the Visiting Agent, the Directors strongly recommend the shareholders to carry over to a new account, they being strongly of opinion that to declare a dividend in the present position of the company would be suicidal.

The estimate for the coming season is 160,000 lb. and tho Directors are fully alive to the importance of keeping expenditure down to the lowest point compatible with efficiency and proper cultivation. The Directors feel assured that the only method of making this property pay is to cultivate highly and to manure heavily, and they are prepared to follow out the recommendations made by the Visiting Agent in his last report relative to the manuring of certain fields.

PLUMBAGO —An offer of £1,000 with a five per cent royalty was made for an option for six months on the mining rights of the property, but the Board thought the offer insufficient, and it was declined. In view of possible developments in connection with plumbago, the Directors think it would be advisable for the Shareholders by consent to authorise them to make such arrangements as may be compatible with the interest of the shareholders,

Messrs. W MacGregor and J A Henderson were elected Directors at the last General Meeting; and of these Mr. Henderson retires by rotation, and does not offer himself for re-election, as he is going home. The Directors recommend the appointment of Mr. Morison, the Visiting Agent, in his stead.

The appointment of an Auditor is left to the meeting.

THE VISITING AGENT'S REPORT.

In reply to your post-card asking for an abridged report on Talgaswela, I think that the following might be taken as the expression of what appears to me important at the present times on Talgaswela.

MANURING.—As previously reported, 40 acres of No 1 was manured in June-August, 1899; while 60 acres of the same field, the 22 acre field, and 4 acres of No. 5 had prunings buried along with basic slag. The appearance of all these fields is very satisfactory, and the fields will I think fully justify the cost of manuring by shewing paying returns within the 12 months, if the work is now completed by manuring in the alternate lines to those in which prunings were buried. This work should be done by applying the manure in long narrow holes 6 inches deep up middle of alternate lines, or by forking in up middle of alternate lines. I recommend 800 lb. per acre as follows:—

lb. per acre.			per ton.	per acre.
500	W Castor Cake	at	68·88	15·37
130	Basic slag	at	54·63	3·17
85	Sulph. of Potash	at	171·00	6·48
85	Blood Meal	at	152·50	5·79
800				30·81
	Tranp. 6 Appl.			4/10 00
				40·81 per acre.

In future working I would very strongly urge the *burying of prunings* as described in previous reports, each hole having added to it on top of prunings about one-half pound of basic slag. [See report of 30th March, 1899.] The present conditions of the tea bushes is so largely due to want of organic matter in the soil, and that want is a point of such vital importance in the considerations of any of. scheme cultivation, that the burying of prunings (the only means available within practical limits for increasing this organic matter) appears to be little less than an absolute necessity. This is emphasized by the fact conclusively proved by chemical analysis that each pruning left unburied deprives the soil of essential fertilizing ingredients to an extent equal to one, two, or three full manurings according to the vigour of the bushes dealt with; in other words, the non-burying of prunings may, in certain circumstances, and at one single pruning, be equal to the throwing away of fertilising matter represented by six years' outlay in manuring on a liberal scale.

A point of much importance as an aid to any scheme of cultivation which may be adopted is that the actual acreage in tea should be clearly defined. An essential element in any system of manuring is the checking of cost against returns obtained, and this is of course impossible with undefined fields. In such fields data which will clearly shew whether and how much manuring pays is impossible, and any work done must be subject to adverse criticism. Without advocating any elaborate detailing of acres, I therefore think a survey which would place the actual tea in the plan in your fair sized fields such as Mr. Symonds recommended for working purposes is a most desirable thing and necessity if cultivation is to go on.—I am, dear sir, yours faithfully, (Signed) R. MORISON,

Neboda, 6th Feb., 1900.

THE CLAREMONT ESTATE CO., LTD.

THE ANNUAL REPORT,

ACREAGE.

	Acres.
Tea in bearing	200
Tea in partial bearing ..	46
Forest, Ravines, &c., ..	90
	336

The Directors submit herewith the Balance Sheet and profit and loss account duly audited for the year ending 31st December, 1899.

The yield for the year was 81,281 lb. against estimate of 85,000 lb. costing 24·54 cts., laid down in Colombo, inclusive of up-keep on the 46 acres New Clearing from which only some 4,000 lb., were secured.

Estimate for 1,900 is 90,000 lb., to cost in Colombo, 25·83 cts.

The Tea was all sold locally realising 34·97 cts. per lb., nett.

Mr. A Orchard retires by rotation and offers himself for re-election.

The election of an Auditor rests with meeting and Mr. Guthrie again offers his services.

In view of the present position of affairs and the near approach of the due date of the Mortgage for £3,500, the directors hope that as many of the shareholders as can attend will come to the meeting.

NEBODA TEA COMPANY, LIMITED

THE ANNUAL REPORT.

ACREAGE :

Tea in full bearing	157 acres.
„ in partial bearing	226 „
„ 2 and rising 2 years old ..	112 „
Total Tea ..	495 acres.
Forest and Waste Land	240 „
Total ..	735 acres.

The directors submit their report and accounts for the year ending 31st December, 1899.

The total extent of the Company's property is now 735 acres, the previous total of 666 acres having been added to by the purchase of 69 acres of forest and chena near Narthupana.

The crop secured, namely 184,322 lb tea was sold in Colombo at an average of 35·09 cents per lb., as against 33·33 cents the price abtained for crop of 1898 of 126,840 lb.

The tea in full bearing yielded as follows :—

On Narthupana .. 755 lb. per acre average.
On Neboda .. 522 „ „

and the cost of production was 22·67 cents per lb. or without manuring, 19·88 cents.

Profit in the year's working amounts to R22,651·62. Of this amount R7,830 was disbursed in November 1899, in payment of an interim dividend at three per cent in the Company's Capital, and the Directors recommend that the available balance, namely R14,821·62 be disposed of as follows:—

In payment of a Final Dividend of two per cent R5,220·00. And the balance to Reserve Account R9,601·62.

In terms of the Articles of Association Mr. Robert Morison retires from the Board of Directors, but, being eligible, offers himself for re-election.

The appointment of an Auditor resists with the Meeting.

HORREKELLY ESTATE COMPANY, LIMITED.

THE ANNUAL REPORT.

The Directors have pleasure in submitting the accounts of the Company for the year ending 31st December, 1899, shewing, after writing off R5,901·95 for depreciation on Buildings, Plant and Machinery, a profit of R19,714·89, which, with the balance of R848·14 brought forward from 1898, gives a total of R20,563·03 available for distribution.

The Directors recommend that a dividend at the rate of 5 per cent on the Capital of the Company be declared. This will absorb R20,000, and leave a balance of R563·03 to be carried forward to 1900.

The working of the estate for the years 1897, 1898 and 1899 compares as follows:—

	1897. R	1898. R	1899. R
Expenditure on Estate & in Colombo office...	32,066·69	37,014·85	36,754·67
Number of Coconuts produced ...	1,400,835	1,437,885	1,305,429
Quantity of Coir Fibre made ... Ballots	28,553	35,474	28,324

Two Directors—Messrs. F. J. de Saram and Stanley Bois retire by rotation, and are eligible for re-election.

The Shareholders have to appoint an Auditor for 1900.

INDIARUBBER IN QUEENSLAND.

The following from the *Brisbane Courier* will be of interest to those who may contemplate taking up an industry that if carefully attended to may lead to an increase in the articles of production from this colony (New South Wales):—"The news from Cairns that a number of local men are arranging to begin operations in the manufacture of india-rubber is important. The raw article can be obtained from indigenous trees in the shrub, and is said to be of first-class quality. What is perhaps, more important, the supply is inexhaustible. One of the chief values attaching to the recent New Guinea concession was the practically unlimited quantity of rubber there obtainable. To find, therefore, that a similar condition of affairs exist within easy distance of a port like Cairns, is to say the least, encouraging. Then, as regards the industry itself, its outlook is as bright as it possibly could be. The marvellous demand for bicycles of late years has given an immense impetus to the rubber trade. India-rubber being also a highly perishable article is another important factor in the question of supply and demand. The demand will always exist, so the supply must be kept going. There is one consideration, however which these Cairns men will find obtruding on their notice sooner or later. That is the question of cheap labour in collecting the article. This must be considered when it comes to competing with others. In New Guinea, for instance, labour is cheap and on the spot. Here in Australia we have practically none of this native labour. The nearness to a port for shipment may counterbalance this advantage which New Guinea rubber traders would derive from a handy labour supply. Our Department of Agriculture has during the year been trying by a series of articles to direct attention to this industry. It will also place another string on the Cairns bow in raising that town into a place of much importance in the future."

RICE-CROP IN SOUTHERN INDIA.—Here is the latest official summing-up :—

The result is that the estimated outturn amounts to nearly 1,940,000 tons of cleaned rice, which is, on the basis adopted, about 30 per cent. less than what may be regarded as a normal crop and is 29 per cent. less than the estimated yield last year. The bearing of these figures on the question whether there is likely to any exportable surplus avilable may be judged by the fact that on the balance of imports of paddy and exports of rice during the ten years ending in 1897-98, the Presidency showed a surplus of 23,976 tons of cleaned rice, and during 1898-99 one of 49,251 tons ; but this result was only rendered possible by importing on the average 88,365 tons of other food-grains for the ten years, and 74,933 tons during 1898-99. This year there has already been a very large excess of grains exported over that imported, and the yield of the "dry" grains has over very wide areas been comparatively poor. They are, in regard to the food supply of the Presidency, of greater importance than the paddy crop.

TEAS AT PUBLIC AUCTION.

A FAULTY SYSTEM.

The practice of rushing teas through at public auction, and the effect on prices, is dealt with by a writer in the "Produce Markets Review," who, under the head of "Combination," refers to certain allegations about which more light is needed. He says: "The recent fall in the price of the lower sorts of teas is currently said to be mainly due to an agreement on the part of a few large buyers to withdraw from the market. As a result of this belief the importers have met this refusal to buy by reducing their offers. In an ordinary state of things this would, no doubt, be a remedy for any combined attempt to affect prices, but in tea it is useless, because the supplies will simply accumulate, there being no means of disposing of them except at public sales. Buyers, therefore, know that, although offers may be scarce for the moment, they are only deferred, and that all wants will be satisfied a little later on. Whether the present alleged combination exists or not, and whether it has had, as is generally believed, so heavy an effect upon the market, we cannot say. At any rate, the allegation brings to light a fresh danger in the present system of public sales. A very few large buyers, as things are, undoubtedly have to some extent the market at their mercy. This should not be the case, and it is simply due to a faulty system. As we have often pointed out in detail, the present plan of forcing off all teas at public sale, and practically directly they arrive, is most injurious to the interests alike of the importers, and of the wholesale trade. It may tend, no doubt, to give a partial monopoly of the market to advertising houses, who must sooner or later recover from the growers some proportion of their 2d. or 3d. per lb. for advertisements, while the rest is charged to the public (a total charge that raises the average price some 20 per cent., and proportionately checks the consumption, again to the detriment of the planter). We hold that the present deplorable position of tea in this country is mainly due to the failure to supplement the public sale system by a proper proportion of sales by private contract, which are absolutely necessary if an article of fancy like tea is to fetch proportionate prices for its various grades and qualities. The reply of the brokers is that a considerable proportion of tea is already offered by private contract; but this is done in a manner which chokes off the bulk of the demand. An offer is made of an entire invoice, consisting of a variety of qualities at once, and the parcels are not subdivided, so that buyers, to get something they may want, have to take perhaps a lot of tea which they have no wish to buy for stock. Surely this is unreasonable, for it really destroys any advantage that might generally be derived from private purchases. It is replied that it would be unwise to let buyers, as it were, pick out the tit-bits of consignments, for the rest of the parcel would suffer. Sellers have, however, a complete safeguard against this in the prices they would accept and there would be no compulsion to sell as there is, more or less, at the present time when goods are put up to public sale. If, instead of withdrawing their supplies, sellers had simply decided to offer the qualities affected by private sale, and at reasonable rates, they would, while breaking down any combination, have at the same time relieved the market. Instead of this, they are only heaping up the supplies. It may be said that a combination might just as well extend to private purchases, and that it does so at the present moment, but such attempts at restriction of trade cannot be maintained except under the opening given by the obsolete public sale system. With regard to the currently reported motive for the alleged combination, we can say nothing here, except that if A sins against B, it is rather hard of B to set to work to punish the importer C, who has absolutely no part or lot in the causes of the quarrel."—*H. & C. Mail*, Feb. 9.

PEARL SHELL FISHERIES OF THE DUTCH EAST INDIES.

Shells constitute one of the most important articles of exportation from Macassar. Up to the beginning of this decade they were sought almost exclusively by natives, fishing in the shallow waters in the bays, without using any diving apparatus. In 1893, according to the United States Consular Agent at Macassar, Celebes, an English company sent a schooner and some luggers to the Aroo Islands to try exploitation in deeper waters. This company appears to have had a good measure of success, for its fleet left the archipelago only when forced by a Dutch law of 1894, to the effect that only inhabitants of the Netherlands and Netherlands India, or companies established in these countries and under the Dutch flag, should be permitted to engage in pearl fishing. In 1896 the Eastern and Australian Trading Association of Amsterdam began operations which, however, do not appear to have been successful, for the company liquidated in 1898. In the meantime, residents of Dutch India were beginning to pay more and more attention to the shell fisheries, and Europeans, Chinese and Arabs endeavoured to make arrangements with the native chiefs, in whose territorial waters shells were supposed to be, and who generally granted the privilege of fishing for a fixed sum in cash, or a per-centage of the quantity fished. Such contracts, however, were legal only after the sanction of the Governor-General of Dutch India, which has been accorded without charge. Shell fishing is at present carried on on the east coast of the Aroo Islands, on the east coast of New Guinea, on the Halmaheisa and the islands adjacent, on the east cost of Celebes and the Timor group. An undertaking on a large, scale is the Djoempandang Maatschappy, established at Macassar in 1898 with a subsidised capital of £12,000, for fishing in the Timor waters, with a fleet of one schooner and ten luggers. The company has succeeded in securing apparently valuable concessions. The chief market for mother-of-pearl shells is Paris; only small quantities are shipped to London, Hamburg and Amsterdam. There were exported in 1896 about 150 tons; in 1897, 200 tons; and in 1898, 250 tons. There is no doubt that 1899 will show a further considerable increase. Notwithstanding this augmentation, prices have been fully maintained. Aroo shells sell at Macassar at £140 per ton; Timor, Ceram and New Guinea and Celebes shells at £80 to £100. Fishing is allowed during the whole year by the Government, but is occasionally prevented by the monsoons. Besides mother-of-pearl, there are also found in the archipelago cheaper varieties, which are obtained exclusively by the natives and used in Germany and England for button manufacture, etc. Of bunda or black-edged shells there is an export of about 18 to 100 tons yearly. Green snail shells are exported to the extent of at least 100 tons yearly and exports of mussel shells amount to about 30 to 50 tons annually.—*Journal of the Society of Arts*, Feb. 9.

PEABERRIES AND MALE COFFEE PLANTS.

Dr. D. Tomatis, commenting on a paragraph in the May number of this Journal (1899) on the subject of male coffee plants writes:—

"As our Government Botanist, Mr. F. M. Bailey, states, the coffee plant is neither *diœcious* nor *monœcious*, but beyond doubt *hermaphrodite* as clearly shown by the examination of its flower. Why should the abundance of *pea-berries* fruit on a tree indicate that it is a *male*? Is not peaberry fruit all the same? And still more a peaberry seed germinates as readily as a bi-lobed berry. The paragraph says that the cause of peaberry fruit is not definitely known. I am surprised at this statement, as it is very easy to find the cause, which is in the poverty of the soil and the dryness of the weather after the blossoming time, as through these two causes the young fruit could not be fully formed, developed, and nourished; hence only one lobe grew, and the germ of the other became abortive and atrophied, and consequently the single lobe or grain grew in a roundish form, and the fruit, being a single-grained berry, is richer in the essential aroma. If the ground be rich, season favourable, tree well trimmed and pruned, and blossoms thinned, very few peaberries will be produced."

Reporting on the question raised in the paragraph and in the above letter, Mr. Howard Newport, Instructor in Coffee Culture, says:—

PEABERRIES AND MALE COFFEE PLANTS.

In the accompanying letter on this subject, sent on to me for an expression of opinion, I fail to see where the question arises as to why the abundance of peaberries on a tree should indicate that it is a male.

On referring to the article in the May issue of the departmental *Journal* quoted by the correspondent, it would seem that the first mention of the idea was in the form of a contradiction. It is later contradicted by the Colonial Botanist, and is in itself a contradiction. The amount of peaberry on a tree has nothing whatever to do with the sex of coffee.

Peaberry is the result of the failure, for some reason or orther, of its fellow-germ to fructify. There are naturally in the embryo berry two cells and it would appear that under certain circumstances one of the cells, on coming in contact with the pollen, will fructify while the other will not.

That it is so is clear on examination of the peaberry where the atrophied germ is discernable, and its envelope of parchment skin, folded together, still in its place within the "pulp." The reason why the pistils should convey the pollen to one ovule and fail to fructify the other, is the point that is not thoroughly understood yet, and not the state of the tree in which it is most liable to this condition, as your correspondent seems to think.

The peaberry is a mal-formation, and generally takes place when the tree is weak or in a state of low vitality, and this condition may be brought about by unfavourable conditions of soil, climate or cultivation. A tree overbearing will produce a larger percentage of peaberry than one with a more moderate crop, even though conditions of soil and climate are as favourable as could be desired.

The shape of the malformed growth is somewhat as your correspondent states. It was thought at one time that it was the production of a special variety of coffee-bush—at any rate, by those who had to do only with the cured article; and there are many yet that still adhere to this fallacy, due chiefly to the fact of its being graded separately.

Pea-berry obtains its higher value in the market chiefly on account of the advantage of its shape in roasting. Being easier to roast uniformly, it is supposed to contain a greater percentage of caffeine or aromatic properties, but this is exceedingly doubtful. Its presence on the tree is of doubtful advantage also. A large percentage of "P.B." grade —indicating, as it does, impaired vitality—although its price is enhanced, is yet a long way short of the value of the double bean in the normal growth.

As a seed for propagation, "P. B." germinates readily, but repeated experiments have been able to show no advantage in the growth, stamina, or bearing capabilities of its production over that of the bi-lobe; nor does the plant raised from a peaberry show any special tendency to produce peaberries.

"MALE" TREES.—The coffee-tree is, as is well known, hermaphrodite; it is also well known that in such cases generally the contact of pollen from another tree or blossom obtains better results than its own pollen. It may be, therefore, that the peaberry is due, to a certain extent, to continued self-fertilising of the plant or "in-breeding."

It is supposed that the plant commonly called the "male" coffee-tree is due to this cause. However this may be among seedlings in a nursery, there is always found a small percentage of plants that appear with long narrow leaves, eyes closer together than ordinary, and a smaller and more stunted growth altogether.

In cultivating these in the field, it is found they bear very little, although they blossom freely. (I have never yet met with one that did not bear at all).

The flower is somewhat smaller than that of the ordinary tree, but would structurally appear to be identical. It is supposed that the want of fertility is due to some malformation of the stigma or ovules, since the pollen is perfectly fertile when applied to other blossoms.

This tendency to produce blossom that will not fertilise, yet will fertilise others, has earned for this long-leaved tree be sobriquet of "male" coffee. Whether the presence of such trees in an estate is Nature's own remedy for a too long-continued course of "in-breeding," and is, therefore, of advantage, is a moot point. Generally the plant is considered useless and unnecessary (since the other trees, being hermaphrodite, can do without it), and since it bears so little, is not considered "worth its keep." It is, therefore, usually picked out and thrown away as early as it shows the tell-tale narrow long leaf in the germinating bed or nursery.—*Queensland Agricultural Journal.*

ENGLISH QUININE.

(To Editor "Chemist and Druggist,")

Sir,—On page 231 of your issue of February 3rd you quote from an interview alleged to have been held by a correspondent of the *Commercial Intelligences* with Mr. Elliot, of Toronto, in the course of which he is reported to have said, "We sell more German than English quinine because it is cheaper and purer." Whether Mr. Elliot is accurately reported or not we do not know, but we do know, that our quinine always passes the Codex Français test easily, whereas a reference to a German list will show that this quality is charged 2m. per kilo more than Ph. Ger. 11, which is the ordinary German quinine of commerce.—We remain, dear sir, yours truly, HOWARDS & SONS.

Stratford, near London, E. Feb. 8.

—*Chemist and Druggist,* Feb. 10.

NOTHING LIKE RUBBER.—It has been suggested that the soldiers in South Africa should be supplied with india-rubber sleeping dresses for outdoor sleeping in the wet and cold nights of South African climate. A trooper, who procured a piece of very thin india-rubber sheeting and put a drawing string through the top of it, found the advantage of such an article as a night covering. It kept him as warm and dry as possible, and when folded up he wore it during the day time round his waist, where it looked like a belt. —*India-Rubber Journal,* Feb. 5.

Correspondence.

To the Editor.

NOTES ON CEYLON BOTANY :—NO. I.

DEAR SIR,—With reference to the cuttings from the *Pioneer re* Indian Botany, which you have kindly sent me for perusal, I think the history of Ceylon Botany will bear an interesting comparison with that of our neighbouring continental flora, inasmuch as the former dates back to a somewhat remoter period.

The Sinhalese, as a race, have been credited with being "natural botanists," and supposed to have possessed in pre-European times some systematic classification of their plants, as so many of their vernacular names would, indeed, seem to indicate. Those of us who have had any acquaintance with plants in other countries cannot but be struck with the comparatively intimate knowledge which the Sinhalese have of their native plants and their uses, as well as with the wealth of vernacular plant-names, which, unlike so-called English names, have the merit of being usually descriptive; many of the botanical names of Ceylon plants are, in fact, mere Latinisations of the vernaculars ; as, for instance, *Elephantopus* Sinhalese "Et-adi," meaning elephant's footprint); *Kokoona* ("Kokoon" of the Sinhalese) ; *Ipomœa Pes tigridis* ("Divi-adiya" tiger's footprint); *Naravelia* ("Uara-vel" of the Sinhalese) &c. A fact which also suggests the precedence of Ceylon over India in early botanical operations is, that so many plants which are as common on the Indian mainland as in Ceylon are named *Zeylanica*. But

"What though the spicy breezes
Blow soft o'er Ceylon's isle"

and figure conspicuously in its ancient history, the earliest record of scientific interest in regard to the Flora of Ceylon, dates from about the middle of the 17th century. Thus the credit of pioneer botanical work here, as in India, belongs to the Dutch, the Portuguese having left no testimony of any special interest being taken by them in the botany of the island.

Prior to 1660 a Mr. Hartog was sent on a botanical expedition to Ceylon by Dr. Sherard, a leading botanist of his time ; but the results of this undertaking are not of much consequence. The first important contribution to the knowledge of Ceylon Botany was made by Mr. P. Hermann, a distinguished scientist of his period and a medical officer of the Dutch East India Company by whom he was engaged in 1670-77 to "describe the plants and spices growing in the island." This was about twenty years before the advent of the *Hortus Malabaricus*, the first published record of Indian Botany. It may easily be imagined that Hermann's task was beset with many difficulties, the interior of Ceylon being then dangerous and practically impenetrable to Europeans, but he succeeded in making a dried collection of plants comprising about 600 species, chiefly in the neighbourhood of Colombo and Galle. This nucleus herbarium, having changed many hands in Europe and been "lost for about half a century," was ultimately purchased by the celebrated Sir Joseph Banks for 75 guineas, and is now an important botanical relic in the British Museum, London.

Hermann supplemented his specimens with manuscripts and drawings intended for publication; but unfortunately the scientific world of his age did not gain by his labours, the result of which was not published till 1717 (22 years after Hermann's death) in the form of *Museum Zeylanicum*, an 8vo. volume with the plants arranged alphabetically under their native names with Latin descriptions. This may be said to be the foundation of the Botany of the East Indies.

A second collection made by Hermann, combined with Mr. Hartog's material already referred to, furnished the basis of the *Thesaurus Zeylanicus*, a 4to. volume issued in 1737 by Professor J. Burman, an enthusiastic botanist of Amsterdam. This was a creditable production in its time, containing 110 well-executed illustrations, with the vernacular names arranged alphabetically above copious Latin letter-press.—Yours truly,

X. Y.

NO II.

DEAR SIR,—Some years later, in 1745, Hermann's herbarium fell into the hands of the illustrious Swedish botanist, Chas. Linnæus, who after two years' careful study of its contents published in 1747 his *Flora Zeylanica*, a small 8vo., in which Ceylon plants are for the first time arranged on the famous sexual system invented by Linnæus himself and which bears his name. This book contains in Latin, a concise view of the progress of Botany from the restoration of learning in the 16th century. The great author has expressed himself thus on the vegetation of Ceylon :—"A delicious climate has granted to this island plants of such variety and value, that scarcely any soil can vie with it for the abundance of its aromatic productions. The pastures are scented with basil (*Ocymum*, 'Maduru-tala' of the Sinhalese) and its wood with cinnamon, cardamoms and flowers of the most exquisite colour, structure and fragrance."* The fact that Linnæus in his epoch-making book, *Species Plantarum* (1753), referred to the Ceylon species as *types*, renders Hermann's herbarium of special scientific value.

Dr. C P Thunberg, the celebrated botanical traveller, and Danish Physician, whose name is commemorated in the beautiful genus *Thunbergia*, visited Ceylon in 1777-80, and was followed in 1782 by Dr. J G Kœnig, the "Father of Modern Indian Botany," who made an important collection of plants in the lowcountry, which he afterwards bequeathed to Sir Joseph Banks and it is now in the British Museum.

Whether in the cause of science or of the system of Government monopoly which was then in vogue, it is recorded that the Dutch had about the middle of the the 18th century commenced an experimental garden in Slave Island, worked by slave labour—hence the name "Slave Island" of today. But this venture had apparently but a short existence.

Thenceforward for three quarters of a century scientific interest in the Botany of Ceylon seems to have languished. With the advent of British rule in 1796 it was recognised that a proper acquaintance with the vegetation of the island was necessary for the due development of its resources, and that the best means of inciting a desire for such knowledge, as well as of introducing and experimenting with new and useful products, was by establishing a duly equipped Botanic Garden.

Accordingly a site was chosen at Peliyagoda, on the Kelani River, and in 1799 Mr. J Jonville

* This passage is probably Heber's justification for his "spicy breezes."—ED. *T.A.*

was appointed Superintendent of the first Botanic Garden in Ceylon. Formerly Jonville was "clerk for Natural History and Agriculture;" being a versatile man and an artist, he made a valuable collection of plants, with drawings, which is now in the British Museum. In 1810 the Botanic Garden was transferred to Slave Island, the site being named Kew (by which name it is still known), in honour of the well-known London establishment of that name.

To give the new institution a practical as well as scientific character, it was in 1812 put under the charge of a qualified "Resident Superintendent and Head Gardener," viz: Mr. William Kerr —a shrewd Scotchman and a pioneer of Botany in the East—who was transferred from an appointment in China. Kerr brought with him, it is said, a number of Chinese and Japanese plants, though obviously but few if any of these could have thriven in a climate like that of Colombo. He, however, introduced successfully into Europe several interesting plants from the Far East, and his name is commemorated in the beautiful shrub *Kerria Japonica.* In pursuance of his love of exploration, Kerr was the first botanist, if not the first white man, to ascend our famous Adam's Peak. At that time, over a great area of what is now cultivated and domesticated, the jungle held sway in

> Savage pride and dignity,
> Proclaiming right of native liberty,

so that malarial fever was rampant, and Kerr succumbed to it in 1814, after a residence here of only two years. During his short regime the honorific title of Royal Botanic Gardens was bestowed on this department, and in 1813, the site in Slave Island being found too limited in extent and liable to floods, he secured the transference of the botanical establishment to Kalutara, the situation chosen this time being a sugar estate of 600 acres, which also proved unsuitable for a Botanic Garden.

X. Y.

THE CEYLON ANACONDA.

DEAR SIR,—Could you kindly inform me as to what part of Ceylon is the Anaconda snake found. Dr. Annandale's English Dictionary (1886) says of Anaconda: "The popular name of two of the largest species of the serpent tribe, namely a Ceylonese species and a South American species, both growing to a length of over 30 ft."—Yours truly,

PYTHON.

[The Ceylon Python or Rock Snake is thus referred to in "Tennent's" Natural History :—

The Python.—The great python* (the 'boa," as it is commonly designated by Europeans, the "anaconda" of Eastern story), which is supposed to crush the bones of an elephant, and to swallow the tiger, is found, though not of such portentous dimensions, in the cinnamon gardens within a mile of the fort of Colombo, where it feeds on hog-deer, and other smaller animals.

The natives occasionally take it alive, and securing it to a pole expose it for sale as a curiosity. One that was brought to me tied in this way measured seventeen feet with a proportionate thickness: but one more fully grown, which crossed my path on a coffee estate on the Peacock Mountain at Pusilawa, considerably exceeded these dimensions. Another which I watched in the garden at Elie House, near Colombo, surprised me by the ease with which it erected itself almost perpendicularly in order to scale a wall upwards of ten feet high.

The Sinhalese assert that when it has swallowed a deer, or any animal of similarly inconvenient bulk, the python draws itself through the narrow aperture between two trees, in order to crush the bones and assist in the process of deglutition.

—ED. *T.A.*]

* Python reticulatus, *Gray.*

CEYLON FISHING CLUB.

TWO INTERESTING LETTERS.

The following two letters were read at the meeting of the Fishing Club held on Tuesday, at the Hill Club, Nuwara Eliya :—

Calsay, Nanuoya.

The Hon. Secretary, Ceylon Fishing Club,
Nuwara Eliya.

DEAR SIR,—I emptied my Rainbow trout pond, and turned 14 into Ambawela stream yesterday. A few I have kept in a pond at this Bungalow. This is a disappointing result out of 76 fry put in on the 27th of April last. The trout were in good condition, and were from 5 to 7 inches.—Yours faithfuly,

G. G. ROSS CLARKE.

North Cove, Dec. 22, 1899.

The Hon. Secretary, Ceylon Fishing Club,
Nuwara Eliya.

DEAR SIR,—On Dec. 11th, I emptied the large stewpond on the Horton Plains, and captured 130 fish, ranging in size from 2 to 6½ inches. Thirty were turned into the river close by and 100 were carried down to the lower water and turned into Tryers' Pool and adjacent water. They were all strong fish. I have reason to believe that some of the fry escaped from the pond shortly after they arrived and I have seen young fish in the stream below the pond that would correspond with the size they should have reached. I shall be obliged if you will send me a cheque for R23·75 being the amount I paid for shrimps and food for the fry.—Yours truly,

(Signed) T. FARR.

A CEYLON TEA REPORT FOR 1899 has just reached us from Messrs. Tarrant, Henderson & Co. We quote one paragraph:—

Taking the year as a whole, it has been a favourable one for producers. The average price throughout for tea has been good. The unfortunate element, however, in connection with the industry, is the fact that demand has more and more continued to run upon lower grade teas. The craze in every part of the world appears to be for "Teas for Price," to the neglect of better grades. This is extremely unfortunate from both a producer's and a consumer's point of view, and is due very largely to the large distributing and advertising firms competing with one another and advertising blends at very low prices. This is much to be regretted, as the larger proportion of lower grades of Indian, Ceylon and China teas are quite characterless, and can give but little satisfaction to the consumer, while the better classes of tea, as a rule have a distinctive character and flavour, and people who have once tried them do not care to go back to the rubbish put before them by the trade. We may say without hesitation, that the difference between teas selling at 7d a lb. and 9d a lb. in Mincing Lane, in point of intrinsic value at present, is quite 6d per lb. so that it is unfortunate that the public do not realise that by paying a little more for their tea they would get so much better value.

PASSARA PLANTERS' ASSOCIATION.

SEVENTH ANNUAL REPORT.

CHAIRMAN.—J J Robinson.
SECRETARY.—W S Taylor.

COMMITTEE.—(Passara). J J Robinson, W S Taylor, G K Deaker, J C Tribe, R A Hope, J B Cotton, J Duncan. (Madulsima). J M Mason, R Webster, W M Kelly, F Hall, R Gatehouse. (Monaragala). J H Betts, J H B Cockburn, S J Sparkes. (Kandy). Chairman, Secretary and G K Deaker.

HOSPITAL VISITORS.—(Badulla). G K Deaker, James Duncan. (Lunugala). R Gatehouse, F Hall.

THIRTY COMMITTEE.—G K Deaker.

REGISTER.—The number of estates on the Register is 42; compared with the last year there is a decrease of two.

MEETINGS.—During the year under review, there have been four Committee Meetings and four General Meetings; these have been very well attended, which goes to show the interest taken by members in the affairs of this Association.

FINANCE.—The Books of the Association are laid upon the table for the inspection of members, and your Committee have much pleasure in bringing to your notice that the amount standing to the credit of the Association with the Bank of Uva amounts to R413·56. Last year's accounts were duly audited by Mr. Cotton.

TEA CROP.—The Estimate for the current year of 1900 is 3,298,800 lb. off 8,395 acres in bearing and 1,852 not in bearing. This gives an average for tea in bearing of 393 lb. per acre and speaks well for the climate and general suitability of this part of Uva as a tea producing country. Prices have been fairly maintained throughout the year and your Committee would impress upon you the many advantages to be derived from placing as much Tea as possible on the local market. The weather during the year was most abnormal, and much against the growth of leaf; we passed through two severe droughts and though the actual fall of rain for the twelve months was satisfactory, yet the distribution of this was calamitous.

COCOA.—Your Committee regrets that the outturn of Crop for this product for the year has been very disappointing and would attribute this serious decrease of crop to the ravages made by the canker and Pod disease which so virulently attacked the Caraccas. Mr. Carruthers treatment as laid down by him, as well as also various other experiments, have been tried, but with very indifferent results; and your Committee view with every satisfaction the late appointment made by His Excellency the Governor of Mr. Carruthers as official Mycologist to the Island. Your Committee take this opportunity of expressing their gratitude to His Excellency for thus moving in this matter and probably saving an industry which is now going through such a precarious crisis. Your Committee view with pleasure the formation by the Parent body of a Cocoa Committe and hope this step will lead to much usefulness and that a fair proportion of the funds at the command of the Kandy Association will now be set apart for furthering the interests of cocoa growers, who, so far, have not had the pecuniary assistance which they have every reasonable right to expect.

COFFEE.—Your Committee would congratulate the fortunate owners of Arabian coffee upon the fine crop gathered during the year; the weather for this product was everything that could be desired with the result that the returns for 1899 have been excellent.

OTHER PRODUCTS.—A considerable acreage has been planted under Rubber and Coconuts in the Monaragala district and the growth of the same gives great promise for its future success, which will probably lead to further extensions.

ROADS AND BRIDGES.—Your Committee have every reason to feel proud with the progress made in the matter of roads and bridges during the year under review. The Wellawaya-Mupane cart road has its bridges now completed and the wheel tracks metalled throughout. The last bridge completed, namely the Kirinde Oya, was a work of great magnitude and reflects the greatest credit upon the officers in charge. The Madulsima grant-in-aid cart road is now open for traffic as far as Dunedin Factory and is much appreciated by the estates at that end of the district. It having been pointed out to the Government by your Association that the breadth of the Kumbalwella-Passara cart road was insufficient for up and down traffic, room has been found in this year's Supply Bill for widening the road at intervals every quarter of a mile. Your Committee have been urging Government to construct a cart road from Passara to Aliput in the interests of the large native population residing in that neighbourhood, who at the present moment have no profitable means for transporting their produce to the nearest market. Your Committee are given to understand that the present Government Agent as well as two former Uva Government Agents have already urged the necessity of a cart road being constructed to connect these two points. The Association is further to be congratulated upon the endeavours made by their worthy representative on the Provincial Road Committee for the great improvements on our Minor Roads, especially in the obtaining of a grant whereby the Nukkala and Hulanda Oya rivers are to be bridged. Arrangements have been made with the Government which provides for the P. W. D. Bungalow at Namunakula being now opened to the public as a resthouse. Your Committee are also pleased to state that there is every probability of a new resthouse being erected close by the cart road at Buttale (Hospital). The endeavours made by your Committee urging the Government to construct a hospital at Mupane, we regret to say, have so far failed, but they yet believe that the Government will realise that the health of the native community is of greater importance than the consideration of the extra outlay involved in erecting this very desirable and much required building.

UNOFFICIAL POLICE MAGISTRATE.—Mr. J M Mason was made an U P M and J P for the Province of Uva on the representation of your Association to Government which doubtless will be much appreciated by our Madulsima members. A considerable amount of crime was unfortunately observable at the commencement of the year, especially round about the Lunugala district, but thanks to the prompt measures taken by our worthy Government Agent, it was speedily stamped out.

LABOR.—Your Committee view with a certain degree of alarm the tightening of the labor market and the consequent substantial increase in the advances now being given out. This doubtless is greatly owing to the heavy public works about to be commenced by Government, who, so far, have stood aloof from importing their own labor, preferring to engage the planters' cooly: if this continues, your Committee much fear that the results of this policy will be disastrous to our enterprise.

TRAMWAY.—Your Committee view with much satisfaction the sanction given by Government for the construction of the Kandapola Light Feeder line, as, in the event of this scheme proving profitable our Light Feeder Line from Bandarawela via Passara to Badulla has been promised next attention by Government.

MR. BAMBER.—This gentleman officially visited the district twice during the year and your Committee look forward with great interest to his forthcoming Report, which it was expected, would have been in our hands ere this.

THE RELATIONSHIP BETWEEN THE PARENT BODY AND THE THIRTY COMMITTEE.—Your Committee are of the opinion that the time has now arrived for these two important bodies to be separated and each possess their own Chairman, as they feel that the duties are too onerous to be discharged by the one officer. It seems unfair to expect one Chairman to devote

the necessary time that is required in attending to the business connected with these two important bodies.

Government Officials.—In conclusion, your Committee take this opportunity of asking you to express your thanks to our worthy Government Agent, Mr. Baumgartner, for the very great interest he has always shewn for advancing the prosperity and development of this province: Your thanks are also due to the Provincial Engineer and his staff for all they have done for us during the year.

His Excellency the Governor.—Your Committee take this opportunity of congratulating His Excellency Sir West Ridgeway upon his complete recovery from his late serious illness and feel sure they are only echoing the voice of this Association in heartily welcoming him back to the Colony.

Ceylon Contingent.—Your Committee wish here to record the pride they feel, in that four gallant members from this Association have joined the Contingent which is now on its way to fight for our Queen and country; we heartily wish them "God Speed" and a safe return back amongst us.

PALMERSTON TEA COMPANY.

ANNUAL MEETING.

The Directors have now to submit their Fourth Annual Report and Accounts being those for the year ending 31st December last. The yield of Tea during the period has been 208,828 lb., costing cts. 28·08, as against cts. 29·55 last year, and realising 45·63 as against 46·12.

As will be seen from the accounts the net profits for the year amount to R23,727·24 after writing off the sum of R5,318·10 for depreciation on Factory and Machinery. An interim dividend of 2½ per cent was paid on 7th August absorbing R10,250, and the Directors recommend that a final dividend of 3 per cent be declared, making a total of 5½ per cent for the year and leaving a sum of R1,177·24 to be carried forward.

Mr. W Sandys-Thomas visited the estates in Jan. and found everything generally in a satisfactory condition. A copy of his report is annexed for the information of the Shareholders.

In terms of the Articles of Association Mr W Sandys-Thomas now retires from the Board but is eligible for re-election.

The appointment of an Auditor for the current year rests with the Meeting.

By order of the Directors,
Bois Brothers & Co.,
Agents and Secretaries.

ACREAGE OF THE ESTATE.

	Queensland.	Palmerston.	Total.
Tea in Bearing ..	254	205	459
Young Tea ..	4	—	4
Total Tea ..	258	205	463
Jungle ...	19	—	19
Timber ..	—	7	7
Grass, &c. ..	4	—	4
Total Acreage ..	281	212	493
			493

	Lbs.		Per Acre.
Yield off Queensland ..	116,099 Tea	—	456 lb.
Palmerston ...	93,584 ,,	—	456 ,,
Total off 459 Acres Tea ..	209,683 lb.		456 lb.

Expenditure per pound of tea as per Reports is as follows, after deducting Capital Expenditure on buildings:—

Queensland	28·21
Palmerston	27·07

N. B.—Included in Queensland is the sum of R4,700 spent on Manure, which is equal to 4cts. per lb. on Queensland Tea.

It is curious that the yield off the two Estates should be the same per acre. Palmerston with manure will, I am sure, increase in yield more than Queensland has done as the soil is better, except on small patches here and there where Palmerston is poor.

Manuring will be continued on Queensland and commenced on Palmerston, on Queensland about 70 acres will be tackled, and on Palmerston about 40 Palmerston will also do about 15 acres with cattle manure.

Capital Expenditure. On Palmerston none is required during the coming year, but on Queensland a new Roller is wanted.

The cost of Tea per pound after deducting the expenditure on capital account for buildings, *i.e.*, R4,131, comes to 28·08, as compared with 29·55 in 1898 and 32·18 in 1897.

Both Estates are in good order throughout.

Coolies are sufficient on Queensland, and on Palmerston the extra 30 coolies wanted will soon be supplied.

The estimate for 1900 is as follows:—

Queensland	...	125,000 lb.
Palmerston	...	98,000 ,,
Total	..	223,000 lb.

AUSTRALIAN OYSTERS' CULTURE.

Australian oysters are cheap and plentiful, being retailed in Sydney at from sixpence to one shilling per plate or bottle. The consumption is enormous, lasting throughout the year, and amounting to several millions of bivalves annually. The whole of the New South Wales coast is admirably adapted for oyster culture. The climate, the nature of the coast line, with its innumerable inlets and creeks, and the natural existence in several varieties of the bivalve itself, all combine to mark its suitability for the culture. At the present time, for the purpose of oyster culture, the Colonial Government grant leases of the foreshores of tidal waters, which may be defined as between the mean high and mean low water mark. The rental is 20s. per annum for every 100 linear yards. The maximum length for which a lease may be obtained is 2,000 yards. There is but little doubt, says Mr. Coghlan, the New South Wales Government Statistician, that the establishment of "parcs," like those which may be seen along the coasts of France and Belgium, where oyster culture is conducted on scientific principles, would be remunerative, as the demand for this delicacy is great, and continually increasing. There is, indeed, a wide field for remunerative employment in this direction, and experts in the art of oyster culture would find every possible facility placed at their disposal. During the year 1897, 14,701 bags of oysters were obtained from the tidal waters of the colony, being a satisfactory increase on the takes of previous years; while in addition to this supply, 2,767 bags of oysters were imported from other colonies, their value being set down at £3,103. In 1898 the quantity imported was 7,110 bags, value £5,322; of which 6,236 bags came from New Zealand, 550 bags from Queensland, 282 bags from South Australia, 30 bags from Victoria, and 12 bags from Tasmania. A bag of oysters contains 3 bushels, and at the beginning of 1899 the price per bag of good oysters in Sydney ranged from 35s. to 40s.—*Journal of the Society of Arts*, Feb. 9.

COTTON IN THE FAR EAST.

Although the first Cotton Mill Company started in Ceylon had to be wound-up, and although on the adjoining Continent most of the once flourishing Cotton Mills are having a very trying time of it, yet there are places in which the cotton mill industry continues to yield fair returns. Indeed, it is in the very ability of Japan and China,—which were till lately the best market, if not for cotton goods generally, at any rate for yarn,—to compete with the old centres of the mill industry, that a special danger now lies. Skilled labour is nowhere cheaper than among the Yellow Races; and it may be doubted whether apter learners and nimbler fingers for delicate work can be found anywhere in the wide world. It is in the readiness with which mechanical knowledge is acquired in the Far East, and in the conversion of the consumer into the producer that Lancashire has found its greatest drawback. The Indian mills were trouble enough with their command of cheap labour, and they undoubtedly compelled contentment with smaller profits than were at one time reaped; but so long as the millions in the Far East remained customers, there was no ground for alarm. Now, the spinning and weaving industry has made considerable strides in Japan which is becoming less and less a purchaser of the cotton goods and yarn which it formerly absorbed in large quantities. It is, however, from China that experts apprehend the greatest danger. Foreign capital has done somewhat to give the industry a start; but now the local capitalist has begun to see prospects of profit in the industry! And what wonder, if the three foreign-owned mills in Shanghai are able to declare dividends varying from 3½ to 7 per cent, without working full time? It may be that the work done is chiefly in the coarser yarns, but these are said to be superior to those turned out in both Bombay and Osaka, and the native capitalist in starting on his own account. The uneasiness of Bombay is, therefore, easily understood.

SUGAR IN QUEENSLAND.

The total quantity of sugar exported from Queensland for the seven months ended January 31, amounted to 96,825 tons as compared with 119,668 tons in the corresponding period of last year.—*Sydney Mail*, Feb. 10.

Dr. W Maxwell, a Honolulu sugar expert, who has just completed his investigation of the sugar industry in Queensland, as well as a number of prominent gentlemen connected with the industry, were entertained at Parliament House by the Premier and the members of the Ministry.—Ibid.

PLANTING NOTES.

Planting on the Johnstone River, Western Australia.—A settler, writing on 1st February, reports :—"We have both small patches of coffee, but not in bearing yet. This district goes in for nothing but sugar and bananas; rice, arrowroot, pines and lemons are being tried; tobacco is a failure owing to blue mould on young plants."

Free Exploitation of Vanila, &c.—The official journal of Costa Rica publishes a decree authorising the free exploitation of sarsaparilla and vanilla, as well as of all other vegetable products found in national forests, except timber.—*B, and C. Druggist*, Feb.

Cheap Tea Wanted !—One of the leading Indian Tea Garden Companies in London recently received a communication from a country grocer, with the following modest request: "Have you an Indian or Ceylon tea that you can put in for 5d or 6d duty paid? If so," says this ingenuous correspondent, "send samples and price list." This would-be patron of British planting enterprise should try Hamburg.—*Planter*, Feb. 24.

Amazonia Rubber and Trading Company (Limited).—The directors, in their annual repotl to December 31 last, submitted at the generar meeting held yesterday, state that the net profif for the past year amounted to £3,299. whereot £1,171 has been absorbed by the interim dividend paid on July 25, 1899. The directors now recommend £1,527 to be paid in completion of a dividend at the rate of 20 per cent. per annum on both preference and ordinary shares for the year ended December 31, 1899, £250 to be placed to reserve fund, and £349 to be carried forward.—London *Times*, Jan. 31.

Tobacco Growing in Ireland.—A prospect of a new industry for Ireland has been opened up by the Irish Agricultural Organising Society, which has shown that tobacco can be profitably grown at Donaghpatrick, in County Meath. The experimental crop raised has been cured and manufactured, and is now being sold by an Irish newspaper at 4½d. per ounce through the post. Competent judges have pronounced the Irish weed an excellent smoking tobacco. and the whole cost of production was but 4d. per lb. Allowing for duty at 2s. 8d., this tobacco, sold at 5s. per lb., would show a profit of no less than £264 per acre. The revenue authorities are strongly opposed to the cultivation of tobacco in the British Isles, and an experiment made some years ago on Mr. Faunce de Laune's estate, in Kent, was most unfavourably regarded. It would be a curious coincidence if the two chief importations of Sir Walter Raleigh should combine for the benefit of the distressful country.—*Daily Chronicle*, Feb. 9.

Petroleum Export Statistics.—The export statistics of petroleum during the past three years show some notable changes in foreign requirements. The export movement reached its maximum in 1897, with a total of 994,297,000 gallons, the succeeding year showing a falling off of 7,817,000 gallons, and last year a further shrinkage of 35,456,000 gallons. Foreign writers have attributed this decrease entirely to the increased competition of Russian oil, but a closer study of the production and movement from various sources of supply proves that the decrease in the exports of American petroleum are not due to direct competition with the Russian product. The production of petroleum in Sumatra, Roumania and Galicia has made rapid strides during the past few years and the product of these sections has displaced just so much oil which would otherwise have been supplied from America or Russia, or in part from both of these petroleum producing countries.—*Oil Paint and Drug Reporter*.

ON TOMATOES.

[BY AN EXPERT.]

"LYCOPERSICUM ESCULENTUM' otherwise tomato, sometimes called love apple, a singular name surely. Most readers doubtless know the tomato belongs to that brilliant natural order the Solanaceæ, than which, very few natural orders are of greater economic importance. The potato, tomato and the brinjal will be qnite sufficient to fix its great importnce to mankind, and then there is the chili: hy the fates what would India be without its chilies? Now the tomato is just one of those excellent things that somehow or another India is very backward in growing: and of all countries on the face of the earth, the one it ought to he abundantly grown in, by reason of its excellent and very well recognised action on the liver and spleen, and general dietetic value. Personally, and notwithstanding Dicken's famous tomato sauce, I am of opinion the cooking of the tomato is a mistake. Plucked when just barely ripe, cut up and eaten just as one would apples, the tomato is delicious, with a fine, firm and crisp fiavour, and then in the form of a well concocted salad it is matchless. But it is important the tomato be gathered when just barely ripe, nicely coloured and no more. When quite ripe it rapidly developes a characteristically mawkish flavour that is not nearly so agreeable, at least to my taste, which is a long and extensive one with tomtoes. Furthermore, it is good practice to gather tomatoes, not more than two-thirds ripe, as it greatly helps heavily laden plants to perfect the entire crop. And they finish the ripening just as well off the plants, to the cosiderable relief of the remainder. As a proof of what tomatoes will do in this way, I may say as I write I have about a maund slung up to the roof of my room, a few beauties of perfect form, would weigh over a pound each, but they are green—there is just a suspicion of whitish coloured green, which is the first intimation of colour coming on: under the simple influence of the fire in the room, they will slowly colour. I cannot say the flavour will be so good as when allowed to two-thirds ripen out of doors. But when I commenced to write this paper there was frost and ice out of doors, and so a knowledge of this ripening of tomatoes off the plants, enabled me to enjoy my maund of tomatoes in spite of destroying frost and ice outside

Now why on earth does not India produce at least one million maunds of tomatoes every year? Why indeed a million maunds, why not ten? It is easy of accomplishment if the "how to do it" is known and of that there shall be no excuse before I leave the subject. The tomato is one of those things that have fallen into the hands of the hybridiser and the raiser—and the hybridiser and raiser is one of the most undoubted and greatest benefactors of his race; and so it comes about that to-day we have uot those ugly, ridged and furrowed, crumpled-up fruits of olden times, but on the contrary brilliant-coloured, beautifully formed fruits of perfect outline, handsome as exhibtion apples. The consumption of tomatoes for London alone goes into tons daily and one mammoth grower alone turns out some dozen tons a week and that too from glass structures, of which he had some time ago considerahly more than a hundred of great length. Now if we take into acoount the high cost of labour, the numerous rates and taxes and the great value of the land, which is no distance from London, and the considerable cost of such an array of glass structures, this one man alone must have spent enough to purchase many sqare miles of land in India. And it pays too, not however by reason of long prices, nothing of the kind, that is the point I wish to emphasise—it is simply due in the main to the scientfic culture, and the enormous crops; such as one never sees in India. Hence I want to point the way for the Indian gardener to go and do likewise, without all the heavy expenditure of glass, high price lahour, &c; and with the model winter climate of India on the plains the tomato should be everywhere abundant and cheap and should pay the producer and the consumer very well indeed.

I hear some reader say "Oh! bnt anybody can grow tomatoes" and that is quite true: they will grow themselves, in fact, if you only plant them—that however is not the way to produce either quantity or quality; and it is quantity combined with quality that pays in most things. We will therefore set aside slipshod methods, and come to a simple yet scientific metbod that will give exceptionally fine fruits and plenty of them.

VARIETIES.

I may say at once the varieties are very numerous, hnt by no means so numerous as the perusal of half a dozen seedsmen's catalogues would lead you to suppose. We all have our little failings and your seedman is nothing lacking. Hence it comes that some tomato is one seedsman's "conqueror," another's "*ne plus ultra*," or Robinson's "Invincible," and as a simple matter of fact this tomato is Brown's, Smiths' and Robinson's leading line in tomatoes: a very fine thing you will find it described, and it is probably quite true; but if you buy it from the three it is a hundred to one you will get one kind of tomato. Here is a practical illnstration. Some eleven years ago a very fine tomato was brought out, called Empress of India; I have grown that tomato ever since, and it is very fine: even today, brilliant in colour, beautifully shaped, and fine in quality, and large. Now I find some difficulty in finding Empress of India in the lists; it has undoubtedly slipped out of a lot altogether, but another kind is pretty general and variously termed perfection: that I have grown and I find it simply my true friend Empress of India Tomato, and about a quarter of a hundred of other kinds grown are largely synonymous. The tomato grower will do well therefore to select a real good type and stick to it, and prove the improvements so-called one or two at a time, and on no account be deluded into a multitude of varieties.

SEED SOWING.

Having made a good selection, sow in hoxes or pots, I find hoxes much the best. The tomato is a considerable time in coming into fruiting from seedlings, therefore sowing should he arranged for in good time, and the boxes may conveniently be ahont four inches deep. Into the boxes put half an inch of drainage, such as cinders, and on this a couple of inches of good garden soil, of a light sandy nature. Now make up a mixture of fine soil, and thoroughly decomposed manure and leaf soil in equal parts, mix all well together and fill in the boxes to with in half a inch of the tops. Firm regularly and moderately, and make all perfectly level with a piece of planed board, and water down the soil. They are now ready for sowing, which should be done carefully. The tomato seed is a large one, and it will he much the best plant to place each seed separately ahout half an inch apart; in this way every seed will have an individual chance, and come up strong, much superior to a hox sown at random, and generally much too thick. Having carefully placed the seed, sift some fine soil over it to depth of two-eighths of an incb, give another light watering, and transfer boxes to some dark warm place, until the seed has germinated, carefully watching the while that the soil in the boxes does not get dry. As soon as germination is seen to be ensuing the boxes may be transferred to the open absolutely free from shade.

PRICKING OFF THE SEEDLINGS.

As soon as the seedlings are strong with a pair of good leaves and another pair in progress, they should be pricked off into other hoxes somewhat deeper. Ordinary kerosine boxes cut in half answer well. Here however the previous proceedings should be reversed as regards soil, and the rich mixture of manure, light sandy loam and leaf should go into the box first, and there may with advantage he two-fourths of manure, one of leaf soil and one of loam to the depth of half the box, on top of this any good light friable garden soil will do. Into this mixture, transplant the seedlings three inches apart

shade for a few days and then transfer fulll into the sun. Attend carefully to watering, and allow the plants to grow unrestrictedly until the boxes are pretty full of roots, in fact what the horticulturist terms slightly root bound. There is a distinct object in this, namely. to induce the plants to show flower much earlier than they otherwise would do so, but the moment the buds can be seen, it will be time to consider their permanent quarters.

PREPARATION FOR PERMANENT PLANTING.

Now the man that can grow good potatoes, should also be able to grow good tomatoes, and if the soil is known to be a good potato soil it will for certain suit tomatoes admirably. For in spite of the very great difference between a potato tuber and a tomato fruit, there is in all other respects a close similarity between the potato plant and the tomato plant, so much so that one can be grafted quite successfully on to the other and *vice versa* and the potato plant will in this way yield a crop of potatoes below ground and tomtoes above it. Furthermore, the tomato, like the potato plant, demands abundance of potash for its vigorous existence: and also like the potato it is a very fine and profuse rooter, therefore hard lumpy soil is ill-adapted to its requirements. The soil should therefore be thoroughly cultivated to the depth of at least a foot or more, and be fine mealy soil, in order that the fine roots may move freely through it and abstract all they require in the early stages of the plants. If the soil is admittedly a good and fertile one, no manure need be added to it in the operation of digging. if however through cropping, or any other cause, the soil is impoverished, a good dressing of thoroughly rotted manure should be added; and if the scrapings of virgin jungle land is available, this is an admirable and valuable manure for the tomato plant.

PLANTING OPERATIONS.

Having thoroughly prepared the soil, and obtained the first indication of flower buds, the plants are now ready for permanent planting, and the exact method to be adopted comes up at once for consideration. The best method of all for the production of fine quality large tomatoes is on single stems, that is to say, one plant, one stem, and therefore no laterals; but this will the better be made clear by an example. Suppose the cultivator selects a piece of ground fifty feet wide, and a hundred long, and plants one foot apart in the lines, and the lines one from the other three feet apart—the plot will require 1,600 plants, and this number may be so planted for single stem plants; or each plant be allowed to carry two, or at the most three stems each, but it comes to much the same thing as the three stems will require room, and there must be a roduction in numbers to allow for this, and the fruits, moreover, are not calculated to come so fine on three stem plants, as on one. I would therefore select the best and most profitable method for exceptionally fine fruits, namely, single stem plants. Accordingly large sized drills, or small trenches may be got out and the first flower buds got as near the surface as possible, in order that the fruiting may begin from the bottom, it may be advisable to lay some plants in slanting to effect this end, which is a very good plan. Any buried stem will be certain to root later on, which is no disadvantage whatever. Suppose this example is carried out, there will be sixteen rows of 100 plants each one foot apart and three between the rows or lines. And this involves a system of training, each plant being grown perfectly vertical. No doubt the best and most economical method in the end is by posts and strained wires; two terminal posts, and one in the centre for each line; but failing this posts may be driven in at intervals six feet long, or more, and by a system of horizontal and vertical lacing of split up bamboo hurdle or gate fashion a substantial training fence be made, and easily taken down, and the wood stored for another season when done with merely leaving the permanent post in the ground, or even these may be taken up, Having planted the young plants previously soaking the boxes before transplanting and doing the planting well, we come to a thorough system of after management.

PRUNING AND TRAINING.

Now whether the grower elects to have one, two or three shoots to each plant; all else should be regulary and systematically destroyed as it appears: with every new point there will inevitably be a couple or three lateral shoots: the moment these are large enough take them out and at the same time secure the plants as they grow to the trellising with a loose tie. In practice this work will be very simple, but it should on no account be neglected at any time; but regularly and systematically attended to, and the lateral shoots taken completely out when quite small; then no other growth can ensue, if it does it must be removed. At intervals all up the main stems there will appear a vigorous bunch of flowers at about nine inches to a foot apart. Now even the best kinds of tomatoes are in the habit of giving some faulty flowers: do not allow these to waste the energy of the plants, but take them out with a fine pointed pair of scissors. This will not be extensive work, but nevertheless should be attended to, and this work will go to the end of the chapter. There will thus be a given number of main stems, and nothing else, absolutely nothing else should be tolerated for a moment. It will happen that some leaves branch out and become very long: these too may be reduced if they crowd each other, taking away one or two pairs of the leaflets. But this must not be overdone, as healthy vigorous foliage is essential to the plants; but the tomato produces such a superabundance under good cultivation I never allow the leaves to crowd each other, and even take some away altogether. When the plants have made good progress and have five or six bunches of developing tomatoes on them, the important question of manurnig and feeding comes in.

MANURING.

The time has now arrived to give the plants a heavy mulch of thoroughly rotton manure, available as immediate plant food. The roots will very speedily come for this manure, and eventually fill it with a regular network of roots. It should be laid on three or four inches thick, and as more and more tomatoes are produced, this manure will be of the greatest possible value. Should the plants become in any way dryish, give a good soaking of water, or better still weak liquid manure, and have the manure slightly trodden at the same time in order that the goodness may be squeezed out. And should the weather continue, rainless the plants may be watered once a week in a similar way. Treated in this way the manure immediately becomes available for the fruit, and practically that alone, and this method will be found far superior in results to heavily manuring the ground in the first place, which is mainly provocative of a rampant growth that serves no purpose, but on the contrary produces long jointed growth, and demands a graet deal of extra pruning. These are the two great factors in successful tomato culture namely, a rigid system of pruning and strict confinement to main stems, and powerful manuring expressly and solely for the benefit of the fruit as distinguished from the plant itself, and by this method, moreover the fruit ripens in regular order commencing from the bottom, and continuing upwards until the plants become no longer profitable. A most important point is to see the manure is of real value and very thoroughly decomposed. In proportion as it is so will be seen its effect on the character of the fruits.

A CALCULATION.

Now estimates are proverbially dangerous things, like prophecies very much, but I am going to venture on a modest one, that is, for certain within the practicable, provided this method of culture is faithfully carried out. And we will carry the quoted

example through: a plot of land 50 by 100 feet; plants or single stems, total number 1,600 at three by one foot planting; five seers of tomatoes per plant—and all of the finest quality be it noted; five by 1,600—8,000 seers of tomatoes. at four annas per seer gives R2,000. But I have in mind that my readers are not ready-made experts. There is much of routine only possible from keen enthusiastic experience, and so I'll reduce this estimate for the planter and the amateur by fifty per cent—that is, the yield, and call it 2½ seers per plant at R1,000. Now I am absolutely at a loss to know how the grower is going to spend R500 by way of expenditure on this culture and everything connected with it to the sale of the produce, but it is conceivable he may do so. Still he has cent per cent profit and that should satisfy the most exacting. This is exclusively applicable to the plains. I would here warn the hill gardener against any heavy speculation in tomatoes, because he has to grow through the monsoon season and that is quite another thing, as I happen to know to my own cost very dearly.

EXAMPLE.

In 1897 I was going to make a small fortune, and had 4,000 plants all grown as detailed here. They got through the rains pretty well, until nearing the end of September, and hung like ropes of onions, to the extent of very many maunds; hundreds of the fruits weighing over a pound each, of faultless shape, and with the colour just developing in all directions. Then there came quite unexpectedly over a foot of rain in twenty-four hours, and I was congratulating myself on how well they had stood the downpour, when lo, on the third day, black spots appeared; on the next day it had developed fifty per cent and ere a week was up, the entire crop was an absolute mass of disease, a total failure and a dead loss.

CONCLUSION.

Like the potato the tomato plant will not thrive in a wet or swampy soil, neither is excessive moisture at any time a blessing. It delights in a well drained, friable, easily worked soil, abounding in potash salts. It may not be generally known that tomatoes are excellent things for cleaning metal with, and taking out stains, &c, due to the potash absorbed by the fruits from the soil. I should suppose too that it is the potash they contain that accounts for their excellent action on the system, at least to a considerable extent. It is therefore an excellent medicine and delicious food, far too little understood and appreciated in this country, and should, I venture to think, be recommended and extended in its culture everywhere, seeing, as I have endeavoured to show, that it could be produced on the plains above all places in quantity and quality, and very far from being a non-profitable crop if the best form of culture is once understood.—*Pioneer*, Oct. 9.

DESCRIPTION OF FERTILIZER MATERIALS.

Indirect Fertilizers.—A stimulant or indirect fertilizer is one which does not in itself furnish directly to the soil any needed plant-food, but whose chief value depends upon the power it possesses of changing unavailable into available forms of plant-food. The stimulants or indirect fertilizers which have been most commonly employed are lime, gypsum and common salt.

Gypsum, or land-plaster, known also as calcium sulphate or sulphate of lime, in some manner aids the process of nitrification, by which ammonia and the nitrogen or organic matter are converted into nitric acid and nitrates. It also acts upon the insoluble forms of potash and other elements of plant-food, converting them into soluble and available forms; it is of value on certain soils to certain crops, such as clover, peas, lucerne and similar plants.

Quicklime or burnt lime, or calcium oxide, commonly called lime, produces changes in both the physical and the chemical character of soils. Freshly burned lime acts chemically upon soils by decomposing vegetable and mineral matter already present in the soil and changing them into forms which are available as food for the plant. Thus, lime acts upon insoluble mineral substances containing potash, etc., and converts them into soluble forms. Lime aids in the decomposition of animal and vegetable matter, such as vegetable mould, stable manure, etc. and tends to convert them into available plant-food. In using lime, care should be taken not to use too large quantities at a time, and, ordinarily, it is best to use it in connection with liberal applications of nutritive fertilizing substances. Lime can be used to advantage on freshly drained swamp-lands and also on lands newly cleared.

Common salt has an indirect fertilizing value which is mainly due to the fact that it has the power of changing unavailable forms of plant-food, especially potash, into available forms.

Danger of Using Stimulant Fertilizers.—It should be kept in mind that these stimulant fertilizers—that is, gypsum (or plaster) lime, and salt,—are not used for the plant-food contained in them; hence, as used, they do not furnish needed plant-food. The chief value of their use lies in the fact that they can change unavailable into available forms of food-plant. It can readily be seen that, when stimulant fertilizers are used exclusively for a term of years, the soil each year loses nitrogen, potash and phosphoric acid, which are not replaced. The inevitable result of such treatment is the exhaustion of these important food constituents from the soil. This affords an explanation of the question often raised now as to why the application of lime does not give such results in crop yields at present as in former days. When lime was the only fertilizing material added to soils for years in succession, it was possible to produce increased crops, so long as there was in the soil enough compounds of nitrogen, potassium and phosphorus to be rendered available by the action of the lime. When, therefore, these forms of plant-food were largely removed, there was nothing for the lime to act upon, in order to increase the supply of available food material. The lime furnished needed no food, but simply helped the crop to use more rapidly the store of plant-food present in the soil.

Direct Fertilizers.—Direct fertilizers contain forms of plant-food, which contribute directly to the growth and substance of plants. Such materials may contain either nitrogen, or potash, or phosphoric acid compounds, or any two, or all three of these forms of plant-food.

Nitrate of soda, known as "Chili saltpeter," is found in large deposits which have been formed in the rainless regions of Chili and Peru. Good commercial nitrate of soda contains from 15½ to 16 per cent. of nitrogen.

Sulphate of ammonia is formed from waste materials produced in the manufacturing of illuminating gas or coke. Sulphate of ammonia contains about 25 per cent. of ammonia, which is equivalent to about 20½ per cent. of nitrogen.

Cotton seed meal is the product fromed by removing the oil from cotton seed by pressure, after which the material is dried and ground. Cotton seed meal contains about 7 per cent. of nitrogen, 3 per cent. of phosphoric acid, and 2 per cent of potash. The hulls of the cotton seed also possess considerable fertilizing value.

Tobacco stems are the refuse from tobacco factories. They contain usually from 5 to 8 per cent. of potash, 2 to 3 per cent. of nitrogen, and a small quantity of phosphoric acid.

Dried blood consists of blood obtained from slaughtering animals; it is prepared for market by evaporating, drying and grinding. The color varies from red to black. Dried blood contains from 10 to 15 per cent. of nitrogen.

Dried fish, scraps and ground fish consist of refuse from fish-oil works and canneries; it is dried

and ground for market. Dried ground fish, of good quality. contains from 7 to 8 per cent. of nitrogen together with as much or more insoluble phosphoric acid.

Meat-scraps, tankage, etc., are slaughter house refuse, dried and ground. Good tankage contains 10 per cent. or more of nitrogen and often 10 per cent. or more of insoluble phosphoric acid.

Nitrogenous guanos are formed in dry regions. The Peruvian guano was rich in nitrogen, containing 7 per cent. or more. They usually contain 7 to 12 per cent. phosphoric acid and about 1 per cent. potash.

Bones consist mostly of calcium phosphate of lime, which constitutes from one-half to three-fifths of the weight of the bone. The remaining portion is a soft, flesh-like substance commonly called gelatin. It is distributed throughout the entire mass of bone, and is rich in nitrogen. When bones are burned, the nitrogenous matter is driven off and only the mineral portion or phosphate of lime remains. Bones, such as are used in making commercial fertilizers, contain 4 to 5 per cent. of nitrogen, and from 20 to 25 per cent. of phosphoric acid, about two-thirds of which is insoluble and approximately one-third available.

Bone-ash is made simply by burning bones in the open air. The nitrogen is lost in burning, and the chief constituent is insoluble calcium phosphate, equivalent to 30 to 35 or more per cent. of phosphoric acid for the most part insoluble.

Bone-black, known also as bone-charcoal, is extensively used in refining sugar. After it has been used several times, portions becomes useless for refining purposes, and are then sold as a fertilizer. It is made by heating bones in closed vessels; the fat, water and nitrogen are driven off, and the bone-black remaining consists mainly of insoluble calcium phosphate and carbon or charcoal. Good bone-black may contain 30 or more per cent. of phosphoric acid mostly insoluble.

Bone-meal goes under various names, such as ground bone, bone-flour, bone-dust, etc., Raw bone-meal contains the fat naturally present in bones. The presence of the fat is objectionable, because it retards the decomposition of the bone in the soil, while fat itself has no value as plant-food. The presence of easily decaying nitrogen compounds in bone hastens, in the process of decomposition, to dissolve more or less of the insoluble phosphate. Bone-meal should contain from 3 to 5 per cent. of nitrogen, and from 20 to 25 per cent. of phosphoric acid; about one-third to one-fourth of the latter appears to be in readily available condition. Raw bone-meal generally contains somewhat more nitrogen (1 to 2 per cent.) and rather less phosphoric acid than steamed bone-meal. The fineness of the meal affects its value; the finer the meal the more readily available it is for plant-food.

Phosphoric Guanos, or Rock Guanos—Guanos generally consist chiefly of the dung of sea-fowls, though the term is applied to other animal products. They are generally found in beds resembling earthy deposits. The guanos which are called phosphatic contain little or no nitrogen. Their phosphoric acid is generally in the insoluble form. These guanos come mainly from certain islands in the Pacific Ocean, and from Caribbean Sea and West Indian Islands. The phosphoric acid in guanos is very variable, ranging from below 15 to over 30 per cent.

Rock phosphates are known under several different names which generally designate the localities from which they come, as South Carolina Rock, Florida Rock, Tennessee Rock, West India Rock, etc. Other forms of mineral phosphates are known under the names of apatite, coprolite, phosphorite, which are found in various places in America and Europe, and some of which are used in making commercial fertilizers. The rock phosphates are extensively used in making acid phosphates. When ground to a very fine flour-like powder, rock phosphates are called "floats." Rock Phosphates contain usually from 25 to 30 per cent. of insoluble phosphoric acid and some as much as 35 to 40 per cent.

Acid phosphates are known under severel different names, such as superphosphates, dissolved bone, dissolved rock, dissolved bone, black, etc. Acid phosphates are formed by treating some form of insoluble phosphate of lime, as rock-phosphate, bone, bone-ash, etc., with sulphuric acid. By this treatment there are formed soluble phosphate of lime and gypsum (sulphate of lime) in nearly equal proportions. Superphosphate made from rock phosphates may contain from 12 to 18 per cent. of available phosphoric acid.

Thomas slag, also known under several other names, such as basic iron slag, Thomas scoria, Phosphate slag, etc. It is a by-product formed in the manufacture of iron and steel from certain kinds of iron ore containing phosphorus compounds. It usually contains between 19 and 20 per cent. of total phosphoric acid, with 6 to 7 and more per cent. of available phosphoric acid.

Cotton seed hull ashes were produced in the Southern State of America at the cotton seed-oil factories, where the hulls, after being removed from the cotton seed, were used as fuel. Such ashes contain from 15 to 25 per cent. of potash, in addition from 7 to 10 per cent. of phosphoric acid. This material is not commonly found now.

Kainit is the most common products of German potash mines. It is a mixture of several different compounds, containing 11 to 13 per cent. of actual potash, together with about 35 per cent. of common salt, also magnesia salts.

Muriate of potash, also a product of the Stassfurt mines, is the main source of supply for potash for commercial fertilizers in our market, and contains 50 to 53 per cent. of actual potash.

Sulphate of potash is a product of the German mines. The product found in the market contains from 48 to 51 per cent. of actual potash.

Sulphate of potash-magnesia is known also as double manure salt or low grade sulphate of potash. This material comes from the German mines and contains 26 to 28 per cent. of actual potash. It also contains 23 to 36 per cent. of sulphate of magnesia.

Carbonate of potash-magnesia contains about 18 per cent. potash and 19 per cent magnesia, both as carbonates. It is practically free of chloride. It is also a product of the German potash mines.

Wood-ashes contain more or less potash, which is present chiefly in the form of carbonate. The amount of potash in commercial wood-ashes varies from below 4 to 7 per cent., the average being under 5 per cent. Wood-ashes also contain between 1 and 2 per cent. of phosphoric acid.

The following are inferior sources of nitrogen. They are very slowly available, and should be used only where immediate effects are not sought. In some states the fertilizer laws either probibit the use of these substances in fertilizers or demand that these goods shall be specified when used in making mixtures.

Hair is obtained from slaughter houses; it is often mixed with dried blood and other forms of animal matter. It contains about 15 per cent. of nitrogen.

Hoof-meal and bone dust are by-products containing 10 to 15 per cent. nitrogen and about 2 per cent. phosphoric acid. They are sometimes treated with superheated steam or with sulphuric acid, the treatment rendering the nitrogen compounds more readily available.

Leather scraps and leather-meal are waste products of various factories. When treated with superheated steam and dried or roasted, they can be finely ground. They contain 7 to 8 per cent. nitrogen.

Farm-produced Fertilizing Materials.—Stable or farmyard manure consists of the soil and liquid excrements of animals fed on the farm, mixed with straw and wasted products of the farm.

Horse manure is difficult to mix thoroughly with litter on account of its being very dry. It is called a "hot" manure, because, on account of its loose texture, it easily undergoes decomposition or fermen-

tation, producing a high degree of heat. On this account it is very liable to lose more or less of its nitrogen in the form of ammonia.

Sheep and Goat manure is quite dry, and is commonly the richest of farm-produced manures. Like horse manure, it undergoes fermentation easily and is classed as a "hot" manure. It is similarly very liable to lose ammonia.

Pig manure varies greatly in composition, but is generally rich as compared with other farm-produced fertilizer materials, and contains considerable water. In decomposing, it produces but little heat, and is, therefore, called a "cold" manure.

Cow manure contains, as a rule, less fertilizing materials than any of the producing manures. It contains a large amount of water, and, in decomposing, generates little heat.

Poultry manure contains a comparatively large amount of all the different forms of plant-food, being especially rich in nightrogen and potash. It undergoes fermentation readily, and loses nitrogen unless properly treated with absorbents or preservatives.

Generally speaking, manures produced from working or fattening animals contain 90 to 95 per cent. of the fertilizing constituents contained in the food. In the case of animals which are neither increasing in weight, nor giving milk, the amount of fertilizing materials in the manure will be nearly equal to that contained in the food eaten. The foregoing statements pre-suppose that all the dung and urine are saved, a supposition that is not often true, considering the manner in which stable manure is commonly treated.

Perhaps the elements of manures least understood is the humick matter, of which ordinary manures contain from 16 to 20 per cent. The litter used in bedding stock furnishes much of this, and the quantity depends upon the nature of the material used. —*Journal of the Jamaica Agricultural Society.*

MOCHA COFFEE.

The American Consul at Aden discusses, in a recent report, a statement which is frequently made; and which has been repeated quite recently, that no genuine Mocha coffee reaches the European or American markets from the Arabian ports. The Consul says this statement is quite erroneous, for the books of his own Consulate at Aden, and of the Consular Agency at Hodeida show that over 5,000,000lb of Mocha coffee were invoiced from these places to the United States last year, not to speak of the quantity sent to Europe. But it is said that, though nominally shipped from Arabian ports, it is really coffee grown elsewhere, and then shipped to Aden to be reshipped as Mocha. This suggestion is also erroneous, as appears from a letter from the British authorities at Aden on the subject. It is true that parcels of coffee from Java, Singapore, and other places are landed in Aden, but, according to the official communication above mentioned, these parcels are bonded in the warehouses of the owners at Maala, and the key lodged in the trade registration department. "When the owner desires to export, a peon of the department is sent with the key to count the bags and bring them to the wharf. As the merchant or owner can have no access to his goods unless accompanied by the peon of the department the transfer of the inferior bean to Aden for mixing with that of Mocha or Harrar is hardly possible." The consul adds that an examination of the Customs authorities' reports shows that foreign coffees are promptly re-exported to other ports, being landed at Aden for transhipment only; while the precautions in Turkish Arabia to prevent mixing are equally stringent. No doubt Mocha coffee is mixed with inferior beans in Europe, and sold as genuine Mocha, but it is hardly possible that an importer buying in an Arabian port could get anything but genuine Mocha or Harrar coffee.—*Chamber of Commerce Journal.*

BARK AND QUININE FLOURISHING.

Even the smallest buyer of quinine, be he a pharmacist, should be interested in the commercial course of that most important of all drugs—quinine. The year 1899 has been a remarkable one in the history of both the crude bark and the finished alkaloid. Java, which has for years left every other country far alway behind in the supply of cinchona, has this year again beaten its record. It has exported about twelve and a-half million pounds of bark, nearly all to Amsterdam, where it has been bought up chiefly by quinine manufacturers who will be able to make from the quantity named 625,000 pounds of quinine and other cinchona alkaloids. Think of it, ten million ounces of quinine practically all sold in a single year. This is not all the world requires in a twelvemonth, but the remaining fifth or fourth of its needs are met from India, Ceylon, Africa and South America.—*B. and C. Druggist*, Feb. 2.

AMSTERDAM BARK MARKET.

At the auctions to be held in Amsterdam on the 15th instant 4,606 packages of ledger, officinalis, and hybrid barks will be offered, as well as 513 cases, 625 bales and 89 serons of succirubra, making a total of 5,833 packages, containing 513,644 kilogrammee (say 505 tons) of bark, equivalent roughly to 25¼ tons (nearly 900,000 ounces) of quinine sulphate. The first hand stock of bark in Amsterdam on January 23rd was 2,606 packages of Government property and 7,246 packages of private bark, a total of 9,852 packages, including that to be effered at the auction on the 15th instant. The shipments from Java for January are reported to be 660,000 English lb.—*British and Colonial Druggist*, Feb. 2.

A NEW "RUBBER PLANT."—The *Semaine Horticole* of January 13 publishes an illustration and a figure of a new species of Ficus, signed F. Eetveldiana, L. Linden. It is a moderate-sized tree, growing in the Belgian Congo. The leaves are on long slender stalks, the blades cordate oblong. It will form a fine shade tree in the tropics, and grows rapidly under cultivation.—*Gardeners' Chronicle*, Feb. 10.

LUPINS FOR GREEN-MANURING.—A *Bulletin*, by J. Burtt Davy, from the University of California, has been issued with the above title. The author gives a bad character to all species of this plant, saying that:—"The Yellow Lupin is considered much more poisonous than the large White, and the Perennial Lupin less so than any other species. In using any species for forage, great care must be taken not to use much at a time, especially of the seeds, and not to use a Lupin ration without intermission. In the event of any cases of "lupinose" appearing, the use of Lupin should be abandoned entirely. Lupin should never be used exclusively in a ration. For forage purposes the Lupins, therefore, do not appear to offer any advantages over other leguminous crops, except as winter growers, and they are certainly more or less dangerous, and not to be recommended indiscriminately."—*Gardeners' Chronicle*, Feb. 10.

AGRICULTURAL AND INDUSTRIAL CONDITIONS IN PARANA, BRAZIL.

Of the three great southern states of Brazil (Rio Grande do Sul, Parana and Santa Catharina), Parana is the least developed. Its area is 85,438 square miles, and its present population, exclusive of the Indians, is about 250,000, 55 per cent of which is colored.

Topographically, the state may be divided into two zones, representing the strongest possible contrast; the littoral zone, situated between the Atlantic ocean and the mountain range which runs from north to south, parallel with the shore—the Serra do Mar; and the mountain zone extending west from there to the Parana river. The narrow strip along the seashore, as a rule, is swampy and unhealthy, the temperature varying between 10° and 35° C. (50° to 95° F.). The altitudes of the table-lands vary from 200 to 1,200 meters (656 to 3,936 feet). The sanitary conditions are very favorable, except where, as in Curityba and Lapa, the soil and water are, for want of proper drainage, poisoned by sewage. The climate is excellent. The average temperature is 17° C. (62° F.) for the sub-tropical part of Parana; in the table-lands the thermometer sometimes (in July) falls below the freezing point.

The harbor of the state—Paranagua (with Antonina)—is connected with Curityba, the capital and distributive centre, by a railroad, which constitutes a masterpiece, not to say a miracle, of engineering, and on its way up the mountains (over 3,000 feet) leads through scenery of unparalleled beauty and grandeur.

It is to be regretted that none of the many pleasure-seekers, travellers, tourists, artists, and students who annually migrate from the United States to France, Italy, Egypt, Germany, and Switzerland find it convenient to visit this beautiful and highly interesting American country, which could be made so easily accessible.

The railroad leading from Paranagua to the interior (Compagnie Generale de Chemins de fer Bresiliens) was built, with French capital, by the celebrated Brazilian engineer Texeira Soares. It comprises the following sections: East from Paranagua to Autonina, 16 kilometers (9.9 miles); west from Paranagua to Curityba, 102 kilometers (63.37) miles); and from Curityba to Serrinha, 71 kilometers (44 miles); thence north to Ponta Grossa, 107 kilometers (66.48 miles), and south to Rio Negro, 89 kilometers (55.3 miles). There is a branch from Restinga to Porto Amazonas (over 12 miles) connecting the railroad with the Iguassu and its tributaries along which the more important colonies are situated. The development of the Iguassu valley is yet in a very primitve state, but this district is destined to have a great future.

The Iguassu river, a tributary to the Parana, is about 800 miles long, but 220 miles are navigable—the section between Porto Amazonas to Porto da Uniao. Although the latter is at present only a little village of about 1,000 inhabitants, there is no doubt in my mind that it is one of the future big cities of Parana; that ere long it will be a large railroad center, outgrowing Curityba, and will control the trade of the most important part of this promising young state. The construction of a railroad from the coast of Santa Catharina through the rich and very populous German colonies Blumenau and Joinville, northwest to a point connecting with the Rio Grande and Sao Paulo road (now in course of construction) and the Iguassu region is a question of a few years; and both these lines will have to touch Porto da Uniao, which place will also be the terminal point of the proposed extension of the Parana trunk line from Restinga Southwest along the Iguassu. After those railroads are completed, trade and commerce along the Iguassu region and within the fertile plateaus in the west of the state will be rapidly developed, and the bulk of the import and export trade of Parana will probably move by way of the Santa Catharina ports—Itajahy and Sao Francisco—more cheaply and quickly than by way of Paranagua-Curityba.

Parana, like the two other south Brazilian states, is crippled for want of capital and proper immigration. Since emigration from Germany has practically ceased, the progress of southern Brazil is retarded.

Serious mistakes were made in the colonization of Parana. Until recently, immigration into Brazil was largely subsidized by the state and the national governments; but it seems the men who had charge of that function were not careful enough in the selection of the material with which they colonized. Large sums of money were wasted and undesirable elements brought to the state in great numbers. Guided by the fear that any one class of immigrants might become too influential by concentration of its forces, some of those formerly in charge of the colonial system located the ninety colonies in such a way as to put the most heterogeneous elements into the closest proximity, intersecting small parcels of one nationality with small parcels of another—Austrian Poles with Russian Poles and Italians, Germans with Russian Poles, Italians with Prussian Poles, etc. Thus the colonial map of Parana presents the aspect of a German-Latin-Slavonic crazy quilt, a fact which is not conducive to a homogeneous development of the commonwealth.

Of the 250,000 inhabitants of the state, about half are natives of Brazil, 40,000 are German, about 40,000 are Italian, 35,000 are Polish (Austrian, Russian, and Prussian), and the rest are of Spanish, French, and other origin.

The import trade is almost exclusively in the hands of the Germans. It amounted in 1897 to $[illegible],000,000 in foreign goods and about $175,000 in domestic goods. There were imported 362,000 kilograms (798,000 pounds) of coffee from Santos and Rio; 46,000 kilograms (101,400 pounds) of tobacco from Bahia; large quantities of dried beef and tongues from Rio Grande do Sul, Argentina, and Uruguay; canned goods and preserves from Germany, either direct or through dealers in Rio. Of manufactured articles, there were imported from Germany machinery, rails, iron, hardware, barbed wire, porcelain, china, earthen ware, lamps, pharmaceutical preparations and implements, cutlery, clothing, gents' furnishing, leather and leather ware, shotguns and revolvers, glassware; from the United States, druggist's supplies and coal oil; from Norway, 837,000 kilograms (1,845,300 pounds) of pine wood. Importation from France has almost entirely ceased. The cotton piece goods were imported from England, which country also furnished the entire supply of coal.

The export during 1897 consisted chiefly of yerba mate (Paraguay tea), some hard wood, and an experimental shipment of hides and horns to France. Two-thirds of the yerba mate exported ($1,500,000) went to Argentina and Uruguay and almost one-third to Chile. Unfortunately, none was exported to the United States. For various reasons, the import of mate into the United States ought to be encouraged. From my observation and personal experience, I feel justified in recommending its use as an excellent stimulant and nerve tonic. It is preeminently a temperance drink, and the temperance societies in the United States could do a very useful work by helping to popularize it. Yerba mate, or Paraguay tea as it is called abroad has all the stimulating and sustaining qualities of Chinese tea or coffee, without the detrimental effect caused by their constant excessive use—affection of liver and kidneys, irritation of the nervous system etc.—and it is very cheap. The great masses in Uruguay and Argentina including the famous gauchos (cowboys) of the great prairies, who drink it constantly instead of water, tea, or coffee, hardly ever use alcoholic stimulants. Intoxication is a rare occurrence there. It is almost incredible what hardships they undergo and how vigorous they are, while often for a successive number of days they use nothing to sustain them but mate.

Aside from the sanitary benefits, in helping to develop the mate industry in Parana, we would secure commercial advantages of great importance. The natural resources of the state of Parana are very

considerable, but as yet, little has been done to develop them. Only a comparatively small part of the state is under the influence of civilization; commerce is in its infancy, and the few industries represented in the state (16 mate mills, 7 small breweries, 3 foundries, 12 barrel factories, some little soap-making shops, a few tanneries, and a furniture factory in Curityba) are all in a very primitive condition. The only exception is a large match factory in Curityba, which is well equipped and does a very profitable business.

Although the soil on the highlands is fertile, containing excellent grazing land, and the climate very favorable, the animal industry—cattle, hog, and sheep raising—is very far from what it ought to be. For want of systematic care and regeneration, the cattle are degenerating and the pastures are neglected. During my travels through the interior of Parana, I found, even in districts with large herds of cattle, milk or fresh butter a rare luxury. They would rather go without milk than trouble themselves to milk the cows.

Agriculture and horticulture are in the same state of inertness, suffering from want of capital, deficient means of transportation, bad roads, and scarcity of help.

A very laudable effort to create a new industry, not only in the state of Parana, but throughout Southern Brazil, has been made by a teacher, Mr. Emil Schenk, of Curityba, who is working hard and successfully to establish rational bee culture. He travels, lectures, and publishes a paper to propagate this work, for which there is an excellent field throughout southern Brazil. I have induced Mr. Schenk to introduce American hives, implements, and machinery appertaining to apiculture. They have given good satisfaction and will undoubtedly, in the course of time, help to secure numerous orders for the specialists (in Ohio) from whom they were bought. Mr. Schenk deserves the fullest encouragement for his intelligent and public-spirited devotion to this good cause.

Commercially and industrially, there is no trace of American influence in the state of Parana; it is therefore doubly gratifying that American intellectuality is represented, highly and ably represented, in another direction—popular education. This report would be incomplete if it did not mention the splendid service rendered to the cause of humanity, Americanism, and good education by the two ladies who conduct the Presbyterian mission school in Curityba—Miss Mary P. Dascomb and Miss Elmira Kuhl. For over a quarter of a century they have devoted their high qualities of heart and mind to the mission work in Brazil, and came pioneering to Curityba over ten years ago. Their school now contains three hundred pupils of all nationalities and is prosperous and successful beyond anticipation.

EUGENE SEEGER.

Consul-General at Rio de Janeiro. Washington, October 17, 1899.

MOTH ESSENCE.

According to the *Neueste Erfindungen und Erfahrungen*, the following makes a splendid moth preventer:—

Take of Spanish pepper...	...	100 parts
——— Turpentine oil ...	...	50 ,,
——— Camphor	...	25 ,,
——— Clove oil	...	10 ,,
——— Alcohol, 96 per cent	...	900 ,,

Cut the Spanish pepper into little bits, and pour over them the alcohol and oil of turpentine. Let stand two or three days, than decant and press out. To the liquid thus obtained add the camphor and clove oil; let stand a few days, then filter and fill into suitable bottles. To use, imbibe bits of bibulous paper in the liquid, and put them in the folds of clothing to be protected.—*Nat. Drugg.*

KEW'S FAMOUS GARDENS.

It is almost impossible to imagine a pleasanter retreat on a hot summer day than the Botanic Gardens at Kew. From the time that Sir William Hooker became Curator of the Gardens they have flourished exceedingly. Sir William, who died in 1865, was succeeded by his son, Sir Joseph Hooker; the present Director is Mr. Thiselton-Dyer, C.M.G., F.R.S.

There is nothing quite like Kew in all the wide world. It forms the botanical centre of the British Empire with its fifty or sixty Governments. There is only one British Empire, and there is only one such institution as Kew Gardens—nothing quite like it anywhere. It is not merely that the Gardens are very large and exceedingly beautiful, though in both these respects Englishmen may well be proud of them. They have a total area of nearly 250 acres, a staff of nearly 200 hands—to say nothing of a good many first-rate hands among them —somewhere about three or four acres of glass, and to keep it all going involves a yearly outlay of £20,000. That which meets the eye or comes within the ken of the ordinary visitor to the Gardens is only a part, and by no means the most important part, of the establishment.

It is a huge BOTANICAL CLEARING HOUSE a, centre of exchange, a wealthy and munificent nursing mother for all the minor establishments of the kind throughout the British Empire; it is a depot to which they can confidently apply whenever they want instructions, or plants, or seeds; it is a fountain head of information for anybody who needs it; and though, naturally enough, Kew gives the first place in its consideration to the British possessions, is on terms of friendly open-handed intercourse with all the world, freely exchanging its treasures with any public garden anywhere under the broad canopy of heaven.

In the sanctum of the Director there are cupboards full of correspondence in all sorts of languages, and from all parts of the world. Ceylon, it may be, finds its coffee plantations being ravaged by disease, submits a specimen of the mischief going on to the experts of the physiological laboratory here, and asks for advice. A merchant in the City has received from some odd corner of the earth samples of an unfamiliar fibrous plant, or one which it is believed may yield a new vegetable dye. He can go to Kew and learn all about it—what the plant is, where it grows, and whether it has already been utilised, and with what results. India some year's ago had no cinchona tree from which to extract the invaluable quinine. Kew suggested that it might very well be grown there, and sent out a stock of plants, and now India yields enormous quantities of quinine. The same has been done for other British dependencies, and quinine, which at one time fetched sixteen shillings an ounce, sells now for four or five.

It is always spring and it is always summer and autumn in one part of the world or another, and all the year round there keep coming into this great central depot parcels of seeds and growing plants cunningly packed in Wardian cases, many of the most dainty and delicate of the denizens of earth's fairest regions turning out on the tables here perfectly fresh and flourishing after travelling perhaps many thousands of miles from the other side of the world. The invention of the Wardian case—an invention only about fifty years old—has greatly facilitated the transmission of growing plants between England and the Colonies, and helped to disseminate fruits and flowers and "economic" plants generally throughout the world. The young nurslings are enclosed in a box, well watered, and tightly shut down under glass, and many of them will thrive better in this limited space than they are found to do afterwards in the magnificent great glasshouses of Kew Gardens.

Plants by the way, do not always take kindly to these great conservatories. They sicken and pine, and it is found necessary to maintain at Kew a small cosy structure, familiarly known in the Gardens as "the hospital." In the great houses it is extremely difficult to maintain the atmosphere at an equable and genial temperature. The plants suffer from the inrush of cold winds through the opened doors, and from the impact of the heated air on the under side of their leaves, but perhaps some day the prisoners in the glass-houses at Kew may have their homes warmed in the manner adopted for sick prisoners at Wormwood Scrubbs, where the cells are heated by hot air carried in at the top and sucked out at the bottom. This would warm the upper sides of their foliage just as the sun does, and no doubt be better for them. As it is, the more delicate plants frequently have to go into hospital, or they would die, as indeed many of them do outright.

At the south end of the Gardens is the Great Palm House, which was built in 1845, at a cost of £33,000. It is 362 feet long, 100 feet broad and 66 feet high, and contains nearly an acre of glass. Inside it is easy to imagine oneself in a tropical forest. Palms, tree-ferns, and others of like kind flourish here: and the visitor may note the date-palm, the betel-nut, the cocoanut, the upas-tree, the bamboo, the cotton-plant, the coffee-shrub, the tamarind and the clove. East of the Palm House is the lake, and westward stretches an avenue through the Arboretum nearly three quarters of a mile long. This is known as Syon Vista, the Duke of Northumberland's estate being within view on the opposite bank of the Thames.

The famous RHODODENDRON WALK, which is one of the chief sights at Kew, runs parallel with the Thames, and is situated near the north-west corner of the Arboretum. The variety of colour here displayed—seen at its best, perhaps, in June—is to those only acquainted with the somewhat stunted shrubs common in private gardens, a relation of unexpected beauty. In its way, the Rhododendron Walk is as famous as is the avenue of horse-chestnuts in Bushey Park, though it has not attained the dignity of being identified with any particular Sunday. The Arboretum used to be separated from the Botanic Gardens proper by a wire fence; and until a few years ago, to the unscientific male visitor, the chief distinction lay in the fact that in the former smoking was permitted, whereas in the Gardens it was prohibited.

The "ARBORETUM"—the original Royal Pleasure Grounds—is a kind of nursery in itself. Here for the past two centuries, experiments have been made in the acclimatisation of trees and shrubs from various foreign countries, and all our parks and public gardens have been enriched and beautified by the additions that this portion of Kew Gardens has made to our botanical wealth. At one extremity of the Arboretum there is a considerable plot of ground parcelled out in squares snugly shut in by thick hedges of privet and holly. Here are nourished thousands of young foreigners, by-and-by to be planted out in the open grounds, but, at present, too delicate to stand our biting winds. Near this nursery are the filter beds, by which all the water supplied to Kew Gardens is filtered. It is drawn in from the Thames to the great lake in the Arboretum, pumped up into the filter beds, then forced up into tanks in Richmond Park, and thence supplied to Kew by gravitation.

To distinguish it from others, the MUSEUM at Kew Gardens is known as museum No. 1. Consisting of three floors and Italian in style, the building faces the Palm House, the large and picturesque lake lying between the two structures. The Museum was begun in the early fifties, and it was extended in 1881, so crowded had it become with the vegetable economic products and preparations of scientific interest sent for exhibition within its walls. Food, drugs, fibres, timber, are among the varied and carefully classified specimens, and in some cases the processes of manufacture are illustrated. It has been well said that the aim of the authorities is to explain in this Museum everything of interest to botanists which the plants, while alive, cannot set forth.

So many are the attractions of these beautiful Gardens that it is difficult to select any particular house for special notice. Popular favour has indicated the Water-lily House as certainly one of the most interesting. It is situated near the large Palm House already referred to, by the pond at the south end of the Gardens. The tank is 36 feet in diameter, and contains many rare varieties of water-lilies. From centre rises a very fine Papyrus plant. In addition to the numerous lilies, the Sacred Bean of Egypt, the Telegraph Plant of India, the Sensitive Plant, and other curiosities, are to be found in the house, which is well calculated to arouse the interest of even the most ignorant visitor. The famous Victoria Regia Water-lily, of which so much is heard, grows in another building.—*Cassel's New Penny Magazine.*

MINOR PRODUCTS REPORT.

ARECA NUTS.—Offered, 117 packages. Sold, 37. These were cheaper, a drop of 5s to 7s being experienced. The prices were from 15s 6d to 17s 6d.

COCOA LEAVES.—Offered 5 packages. Sold 5. Ceylon leaves of Huanoco character sold at 1s 0½d, and broken small at 7d.

CITRONELLA OIL.—Offered, 4 packages. Sold 0. These were bought in at 1s 1d.

CINNAMON.—In auction, on Wednesday, 254 packages were offered and 23 sold at ⅜d for wild without reserve.—*B. and C. Druggist*, Feb. 9.

CINCHONA.—The Nederlandsche Veem cinchona department at Amsterdam report the shipments during January, 1900, from Java to Europe, at 615,000 Amst. lb against 509,800, 1899; 956,000, 1898; 390,000, 1897; 970,000 1896; 657,000 1895; and 893,000 1894. The total amount of bark to be offered at the Amsterdam auctions on February 15th, weighs 513,644 kilos., containing 23,504 kilos. quinine sulphate, with an average percentage of 5·04 per cent., against 5·30 per cent in the January auctions, and 5·38 per cent for the ten auctions of 1899.

COCOA BUTTER.—For the 70 tons offered at Amsterdam on Tuesday, there was a brisk demand. The auctions opened at 94½c, advancing rapidly to 120¼c, the average price being 105·45 per half-kilo. Twelve tons of Helm brand sold at 100c to 105¼c, and 4 tons de Jong at 100c to 100¼c, while 5 tons Mignon were bought in. In London auctions 110 tons Cadbury's brand sold at 1s 4½d to 1s 5½d per pound, the average being a fraction over 1s 4⅝d against 1st 5 9-16d in January.—*Chemist and Druggist*, Feb. 10.

INDIA-RUBBER is produced by the landolphia of Africa, and the French have made large plantations of it, but there has been a difficulty of getting the gum from the bark as well as from the leaves. M M Arnaud and Verneui's, in a paper to the Academie des Sciences, Paris, describes a new method which extracts good rubber from the bark.—*Globe*, Feb. 9.

TEA &c. NOTES FROM WYNAAD.

(*From a Correspondent.*)

Wynaad, Feb. 25.

FORMER CEYLON MEN.

Since you published your last "Notes" from this district, we have lost two of our most popular and respected residents, who were formerly in your island:—Messrs. Stewart Robinson and W Q Wright. The former had gone home for a year, "on private affairs," while failing health compelled Mr. Wright, to seek a change to England, under medical advice. Both gentlemen took a prominent part in all local athletic gatherings, and their friends look forward to their return with favorable anticipations. On the other hand, we have had the pleasure of welcoming Mr. W Parry from Ceylon, the proprietor of the "Sentinel Rock" estate at Vellera Mulla.

"OUR GROWING TEA INDUSTRY"

in South Wynaad continues to make most satisfactory progress, all the clearings planted in 1898, having come on extremely well, with a minimum of vacancies; while the lands opened in the past monsoon, bid fair to equal the former in every particular. Another fine factory has been added to those previously erected in the country, Messrs. Parry & Co. of Madras, having added such a building to their splendid Pioneer Tea Company's block, at Vellera Mulla last season. Dr. George Watt, Reporter on Economic Products to the Government of India, who paid a brief visit to South Wynaad, towards the close of last year, was especially impressed with the capabilities of the district, in soil and climate, for the profitable cultivation of tea, and highly eulogised the older fields which he was afforded an opportunity of inspecting. Dr. Watt appears to have formed the opinion, that when the older tea already opened, as well as that more recently planted in Wynaad, reaches full bearing capacity, that the average yield will rival the most productive tea districts in India; at the same time he is credited with having discovered and identified the 206th blight with which the tea bushes in Asia is attacked, but up to date, local proprietors do not appear to have been disquieted by this new enemy, and as most of the tea in Wynaad has been planted in detached blocks, with fallow lands dove-tailed in between the gardens, there is reason to assume that an epidemic is less likely to overrun the country, than where an unbroken stretch of the tea bush obtains.

PRICES.

At the same time the opinion is held by competent judges, that the prices realised by Wynaad teas, during the last 12 months, are by no means as satisfactory, as was to be expected from a country which has been so highly eulogised for its advantages in the profitable growth of tea.

In connection with this subject, it is a singular coincidence, that the breaks of tea sold in London, from gardens under the immediate control of Wynaad planter whose experience of tea manufacture is covered by the last quinquennium, have *generally*, if not *invariably*, secured higher prices, at the same sales, than the produce of properties, solely under the ægis of experienced Ceylon tea planters who have settled in this district. The following quotation from a South Indian journal conveys a fair impression of this subject:—"Wynaad is represented by 'Chulika,' 'Richmond' and 'Kanombyle,' as also by 'Perrengodde,' 'Erramacullee' and 'Perindotty.' The first three properties' teas all realized an average of over 8d for considerable breaks, while the latter trio are quoted at 6¾d, 6½d and 6¼d respectively. The former group are entirely supervised by old Wynaadians, while the last-named are bossed by Ceylon men." "Perindotty," in these figures, boasts "wooden spoon." as its produce *invariably* figures at the *foot* of the lists. But as the managing proprietor, who came over here in 1896 publicly asseverates, that his domain returns an annual yield of 500 lb. of made tea per acre, which he places f.o.b. for 4d, and disposes of in Mincing Lane for 6½d on the average, while he successfully "places" all his coarser grades of tea locally, amongst native buyers at 5 annas per lb., his ambition would appear to be satiated and he is to be congratulated on the result, in so far as his own balance-sheet is affected; but, to the dispassionate on-looker, it is obvious that as long as the public sale-lists of Wynaad teas are weighted with produce of the class under reference (Perindotty), the average for the district works out at a figure, which conveys an imperfect impression of the capabilities of Wynaad for growing high-class teas. A well-known resident in Ceylon, who has enjoyed the widest opportunities of forming an accurate opinion on these topics, holds the view, that under really skilful manufacture, Wynaad teas should average fully 2d per lb. in excess of the usual sale prices! In the contiguous Nilgiri district of Wynaad, some very fine young tea has been planted within the past two years, while the older fields have been described as equal to anything of the kind in S. India, sales from such properties averaging up to 9d in London.

HOW TO DEAL WITH LABOUR.

There is one point to which the attention of Ceylon men, who may contemplate settling in the Wynaad, should be specially invited, viz., to the unwisdom of taking the law into their own hands, in dealing with local labourers where the standard of work accomplished by the latter falls below what they have been accustomed to look for, in your island, where the discipline in force is entirely different from that ruling in this part of India. Irrespective of the view held by the Wynaad planters, that it is distinctly cowardly for an Englishman to strike an Indian cooly labourer simply for indifferent work, planters who resort to such drastic methods will soon realize that they will not merely drive away their labour, but lose the capital invested in enlisting such people, with the result that their properties will be overrun by weeds, and they themselves will have earned an equivocal notoriety, which is likely to prove a formidable handicap for the residue of their stay in the country. We have a couple of such instances unfortunately in South Wynaad, to substantiate these views.

COCONUT PLANTING ON N.-W. COAST OF CEYLON.

MARAWILA, Feb. 27.

The drought has been broken this month by two falls of rain we had on the morning and eve ing of the 25th inst., measuring ·85 cents of an inch. The rain was very welcome and was eagerly sucked up by the parched and dry soil. The price of copra and coconuts is keeping up. There seems to be a great demand for the former in Colombo, and agents of some members of the De Soysa family are buying up all they can and at high prices. The copra trade at Madampe and Chilaw is almost entirely in the hands of Chetties, who are very disinclined to sell the stuff locally even at tempting prices. The results of the drought of last year are apparent not only in small crops, but in lower outturns of copra and desiccated stuff per thousand nuts. Those who are paid at the mills for their nuts according to the outturn, find the outturn less than of the previous crop.

RAINFALL RETURN FOR COLOMBO.

(Supplied by the Surveyor-General.)

	1895.	1896.	1897.	1898.	1899.	Av of 30yrs.	1900.
	Inch.	Inch	Inch	Inch	Inch.	Inch.	Inch.
January ..	5·00	2·92	3·81	2·32	6·98	3·22	3·72
February ..	0·81	0·35	1·68	1·98	2·78	1·93	0·63*
March ..	1·84	5·64	3·66	4·21	0·88	4·78	
April ..	9·34	5·93	10·97	22·81	6·66	11·31	
May ..	10·09	9·31	8·30	5·80	17·73	12·09	
June ..	13·99	8·37	10·14	10·94	9·23	8·37	
July ..	0·52	2·85	5·24	6·15	1·11	4·38	
August ..	0·92	6·35	9·09	0·97	0·62	3·67	
September	4·09	10·99	4·58	6·90	1·48	5·01	
October ..	30·36	16·78	4·71	20·60	12 99	14·52	
November..	5·83	19.81	11·68	17·38	8·58	12·66	
December..	9·44	11·76	8·89	3-05	4·44	6·39	
Total..	92·23	101·06	82·73	103·11	73·48	88·33	4·35

PLANTING NOTES.

"KEW'S FAMOUS GARDENS"—are graphically, as well as popularly, described in our daily and *T.A.*, and certainly not too much is made of what British dependencies all round the world owe to Kew.

CEYLON TEA FOR AUSTRALIA.—The following from the Report of Messrs. Tarrant Henderson & Co. is not very reassuring:—

The following extract from a Melbourne circular explains the position, and shows plainly how Ceylon teas have lost ground during the past year:—"The most noticeable feature of last year's trading as regards this market has been the increased demand for Indians, at the expense of Ceylons. If Indians should displace Ceylons to any appreciable extent, the present demand for Chinas will most assuredly continue, if not increase, as a larger proportion of the milder flavoured Foochow teas would be required by blenders to counteract the more astringent properties of Indians, as compared with what is needed when Ceylons are more largely used. Demand runs principally upon teas up to 8d. Ceylons, owing to high costs and poor quality, as compared with Indians, have gone very much out of favour. The latter throughout the year have shown excellent value. Chinas have experienced a steady market, demand being entirely for clean liquoring sorts from 5½d to 6¾d, which has been fully supplied." The foregoing, we might say, does not apply to Australia only, but it also applies very largely to the United States, Canada and Russia, whilst to Europe generally, shipments have been disappointing.

* From 1st to 28th Feb. 0·63 inch, that is up to ·30 a.m. on 1st Mar.—ED. T.A.

Ceylon Rainfall.

THE P. W. D. METEOROLOGICAL OBSERVATIONS OF JAN. 1900.—We append a Monthly Return of rain from which it will be seen that the highest fall was at Naulla in the Eastern Province, 21·40 inches and the lowest at Kayts in the Northern Province 0·38 inches.

WESTERN PROVINCE.

Negombo, Mr. Bucknall (6) ... 5·05
Kalutara Mr. Gregson (36) .. 4·93
Labugama. Mr. Bond (369) ... 15·21
Henaratgoda, Mr. Silva (33) .. 3·87

CENTRAL PROVINCE.

Katugastota, Mr. Morgan (1,500) ... 7 53
New Valley, (Dikoya) Mr. Ward (3,700) .. 5 97
Helboda (Pussellawa) Mr. Anderson, (3,300) .. 5·30
Yarrow Estate, .. Mr. Peto (3,400) ... 5·98
Peradeniya Mr. ... MacMillan (1,540) ... 4·67
Duckwari, Mr. Edwin (3,300) ... 6·81
Caledonia, Not received (4,273) .. —
Pussellawa, Mr. .. Powell (3,000) .. 7·69
Hakgala, Mr .. Nock (5,581) ... 5·13
S. Wanarajah Estate, Mr. Tatham (3,700) .. 4·40
Padupola, Mr. Ward .. (1,636 ... 4·87
Mylapitiya, Mr. Rowland (1,767) ... 1·97

NORTHERN PROVINCE.

Mullaittivu, Mr. Sanmukam (12) .. 3·54
Jaffna Mr. MacDonnell (8) 1·00
Mankulam, (N. Road) Mr. Walker (167) ... 2·99
Elephant Pass, Mr .. Kretser (7) .. 1·72
Vangalachettykulam, Mr. Oorloff (178) .. 2·10
Point Pedro, Mr. Chittampalam (24) ... 0·44
Jaffna College, Mr. Cooke (9) ... 1·86
Kayts, Mr. Kretser .. (8) .. 0·38
Kankesanturai- Mr. .. Pararachasingha (10).. 1·18
Pallai, Mr. Kretser (24) .. 0·65
Murlkandy, (North-Central Road) Not received — —
Nedunkeni. Mr. Saumukam (122) ... 8·74
Chavakachcheri, Mr. Kretser (16) ... 1·22
Udupiddi, Mr. Hastings (35) ... 0·66
Marichchukaddi, Mr. Thamotharampillay (14) 1·55
Murungan, Mr. Ramalingam (52) 0·94
Vavuniya Mr. Walker (318) 3·52

SOUTHERN PROVINCE.

Ella Vella Mr. Adams (262) 5·36
Kekanadura, do (150) 1·45
Denagama, do (286) 4·17
Udukiriwila Mr. Laurensz (235) .. 2·80
Kirama, Not received (260) —
Hali-ela Mr. Adams (200) 5·70
Tissa Mr. Peries (75) ... 3·92
Matara Mr. Adams (15) 2·95
Dandeniya, do (157) .. 5·27
Urubokka, Mr. do
Tangalla Mr. Fox (94) .. 4·20
Mamadola. Mr. Rodrigo (56) .. 2·58

EASTERN PROVINCE.

Irrakkamam, Mr. Bower (42) ... 16·28
Devilana, Mr. Vanderstraaten (136) 4·08
Sagamata, Mr. Bower (40) ... 13·63
Ambare, do (65) 11·92
Kanthalai, Mr. Carte (150) 3·21
Allai, Mr. Carte (95) 4·25
Rukam, Mr. Vanderstraaten (120) ... 6 45
Periyakulam, Mr. Carte (20) ... 5·61
Chadaiyamalawa, Mr. Robertson (57) 11·65
Kalmunai, do (12) 12·17
Rotewewa, do (30) 13·-8
Lahugala, do (70) 14·70
Naulla, do (30) 21·40
Andankulam, Mr. Carte (41) ... 5·46
Manalpaddy, Mr. Vanderstraaten (21) 13·15
Maha-Oya-Tank, Mr. Vanderstraaten (190) 10·16

N.-W. PROVINCE.

Magalawewa, Mr. Dassaneiyake (176) .. 6·21
Maha Uswewa tank, Mr. Crabb (160) ... 3·70
Tenepitiya, Mr. Churchill (8) ... 5·80
Batalagoda, Mr. Fonseka — 4·95

N.-C. PROVINCE.

Kalawewa, Mr. MacBride (268) 6·40
Maradankadawala, Mr. MacBride (443) ... 3·97
Mihintale, Mr Drieberg (354) .. 5·63
Horowapotana, Mr. MacBride (217) .. 4·54
Madawachchiya, Mr. MacBride (285) .. 1·80
Topare, Mr. Jayewardane (200) .. 4·51
Minneriya Mr. Eves — 6·18

UVA PROVINCE.

Bandarawela, Mr. Tocke (4,000) .. 5·37
Haldummulla, Mr. Viramuttu (3,160) .. 7·70
Kumbukan, Mr. Emerson (446) ... 7·61
Koslanda, Mr. Emerson (2,258) ... 8·09
Tanamalwila, Not received (550) .. —
Bibile, Mr. Silva (680) 11·87
Taluena, Mr. Fernando (1,100) .. 7·30
Allutnuwara—Mr. Leembriggen (3 0) 11·72

SABARAGAMUWA.

Ambanpitiya, Mr. Caldicott (729) 4·05
Pelmadulla, Mr. Clarke 4·05 (408) 14·62
Kolonna Korale (Hulanda-oya) Not received (203) —
Avisawella, Mr. Jeffery (105) ... 6·16

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company.	paid p. sh.	Buyers.	Sellers.	Transactions.
Agra Ouvah Estates Co., Ltd.	500	900	925	925
Ceylon Tea and Coconut Estates	500	—	950 n'l	..
Castlereagh Tea Co., Ltd.	100	90	100	..
Ceylon Hills Estates Co., Ltd.	150	—	—	..
Ceylon Provincial Estates Co.	500	..	—	505
Claremont Estates Co., Ltd.	100	..	..	—
Clunes Tea Co., Ltd.	100	—	85	..
Clyde Estates Co., Ltd.	100	—	—	—
Doomoo Tea Co., Ltd.	100	—	60	—
Drayton Estate Co., Ltd.	100	..	150	..
Ella Tea Co., of Ceylon, Ltd.	100	—	72·50	—
Estates Co., of Uva, Ltd.	500	—	280	..
Gangawatta	500	...	..	—
Glasgow Estate Co., Ltd.	500	...	910	905
Great Western Tea Co.,	500	...	640	..
Hapugahalande Tea Estate Co.	200	—	.	..
High Forests Estates Co., Ltd	500	..	500	..
Do part paid	350	...	400	—
Horekelly Estates Co., Ltd.	100	..	—	..
Kalutara Co., Ltd.	500	..	375	—
Kandyan Hills Co., Ltd.	100	—	70	07·50
Kanapediwatte Ltd.	100	100	90	..
Kelani Tea Garden Co., Ltd.	100	40	...	..
Kirklees Estates Co., Ltd.	100	—	..	—
Knavesmire Estates Co., Ltd.	100	—	60	60
Maha Uva Estates Co., Ltd	500	..	425	400 xd
Mocha Tea Co., of Ceylon, Ltd.	500	...	610	610
Nahavilla Estate Co., Ltd.	500	—	475	...
Neboda Tea., Co. Ltd	500	500	..	—
Nyassaland Coffee Co. Ltd.	100	—	..	..
Ottery Estate Co., Ltd.	100	..	—	—
Palmerston Tea Co., Ltd.	500	—	400	...
Penrhos Estates Co., Ltd.	100	—	97 50	..
Pine Hill Estate Co., Ltd.	60	40		..
Pitakanda Tea Company	500	1,000	—	..
Putupaula Tea Co., Ltd.	100	—	120	—
Ratwatte Cocoa Co., Ltd.	500	—	.	..
Rayigam Tea Co., Ltd.	100	—	65	—
Roeberry Tea Co., Ltd.	100	..	—	—
Ruanwella Tea Co., Ltd.	10	—	00	..
St. Heliers Tea Co., Ltd.	500	500	—	..
Talgaswela Tea Co., Ltd.	10	25	—	25
Do 7 per cent. Prefs.	10	...	..	..
Tonacombe Estate Co., Ltd.	500	—	450	—
Udabage Estate Co., Ltd.	100	..	—	—
Udugama Tea & Timber Co., Ltd.	50	5	10	..
Union Estate Co., Ltd.	500	290	300	—
Upper Maskeliya Estate Co., Ltd.	500	..	475	—
Uvakellie Tea Co., of Ceylon, Ltd.	100	65	70	...
Vogan Tea Co., Ltd.	100	..	83	—
Wanarajah Tea Co., Ltd.	500	—	1145	...
Yataderiya Tea Co., Ltd.	100	—	397·50	...

CEYLON COMMERCIAL COMPANIES

Company.	paid p. sh.	Buyers.	Sellers.	Transactions.
Adam's Peak Hotel Co., Ltd.	100	—	—	..
Bristol Hotel Co., Ltd	100	—	85	80
Do 7 per cent Debts	100	105	—	—
Ceylon Gen. Steam Navgt. Co., Ltd.	100	200	..	200
Colombo Apothecaries Co., Ltd	100	..	145	.
Colombo Assembly Rooms Co., Ltd.	20	12 50	..	..
Do prefs.	20	—	..	..
Colombo Fort Land and Building Co., Ltd.	100	..	85	85
Colombo Hotels Company	100	..	294	—
Galle Face Hotel Co., Ltd.	100	—	150 xd	..
Kandy Hotels Co., Ltd.	100	..	—	...
Kandy Stations Hotels Co.	100	..	30	—
Mount Lavinia Hotels Co., Ltd.	150	150	200	..
New Colombo Ice Co., Ltd.	100	170	—	—
Nuwara Eliya Hotels Co., Ltd.	100	27½	30	..
Public Hall Co., Ltd.	20	15	—	—
Petroleum Storage Co.	100	—	—	—
Do 10 % prefs.	100	—	...	—

LONDON COMPANIES.

Company.	paid p. sh.	Buyers.	Sellers.	Transactions
Alliance Tea Co., of Ceylon,	10	8—9	—	..
Anglo Ceylon General Estates Co.	100	—	35—40	..
Associated Estates Co., of Ceylon	10	—	3—5	...
Do. 6 per cent prefs.	10	..	7½	..
Ceylon Proprietary Co.	1	...	12·6—17 6	..
Ceylon Tea Plantation Co.,	10	—	24½—25½	—
Dimbula Valley Co.,	5	..	5½—6	—
Do prefs.	5	..	..	—
Eastern Produce and Estates Co.	5	...	5½—6	...
Ederapolla Tea Co.,	10	...	7—8	..
Imperial Tea Estates	10	...	5—6	..
Kelani Valley Tea Asson.,	5	..	5—6	..
Kintyre Estates Co.,	10	7½	7—9	..
Lanka Plantation Co.,	10	4½	4—5	..
Nahalma Estates Co ,	1	—	¼—½	..
New Dimbula Co.,	1	—	2½—3	..
Nuwara Eliya Tea Estate Co.	10	9¾	—	9½
Ouvah Coffee Co.,	10	7	—	..
Ragalla Tea Estates Co ,	10	—	10	..
Scottish Ceylon Tea Co.,	10	—	14—15	.
Spring Valley Tea Co.,	10	3	4—5	..
Standard Tea Co.,	6	—	11—12	..
The Shell Transport and Trading Company,	100	—	—	—
Yatiyantota Ceylon Tea Co.,	10	—	8—9	..
Yatiyantota pref. 6 o/o	10	10	—	..

BY ORDER OF THE COMMITTEE.

Colombo, March 2nd, 1900

Latest London Prices,

THE LOCAL MARKET.

(By Mr. James Gibson, Baillie St., Fort.)

Colombo, Feb. 27th, 1900.

COFFEE:—	
Estate Parchment per bushel	R7·50 to 9·00
Chetty do do	R6·00 to 7 00
Native Coffee / do F. O. B } per cwt.	} R42·00
Liberian coffee:—per bushel	R4 00 to 4 50
do cleaned coffee:—per cwt	R22·00 to 24·00
Cocoa unpicked:—per cwt	R38·00 to 42·00
do cleaned do	R43·00 to 46·00
Cardamoms Malabar per lb	R1·00 to 1·10
do Mysore do	R1·55 to 1·80
RICE:—	
Soolai per bag of 164 lb. nett	R9·00 to 9·25
Slate or 1st quality:—per bushel	R3·42 to 3·45
Soolai 2 & 3rd. do do do	R3·33 to 3·40
Coast Calunda	R3·37 to 4·00
Coast Kara	R3 75 to 3·87
Kazala	R3·28 to 3·30
Muttusamba Ordinary	R3·87 to 4·25
Cinnamon. per lb No 1 to 4	R[illegible]·52
do do 1 to 2	R0·65
do Chips per candy	R9[illegible]0 to 95·00
Coconuts Ordinary per thousand	R35·00 to 38 00
do Selected do	R36·00 to 40·00
Coconut Oil per cwt	R14·50 to 14·67½
do do F. O. B. per ton	R2[illegible]0·00 to 293·50
POONAC:—	
Gingelly per ton	R1[illegible]0·00 to 102·50
Coconut Chekku do	R85·00 to 87·50
do Mill (retail) do	R77·50 to 80·00
Cotton Seed per ton	R8[illegible]·00
Copra per candy	
Kalpitiya do	R45·50
Marawila do	R43·50 to 44·25
Cart Copra do	R38 00 to 42·00 Scarce
Satinwood per cubic feet	R2 00 to 2·25
do Flowered do	R5·00 to 6·00
Halmilla do	R1·90
Palu do	R1·00 to 1·12
Ebony per ton	R75·00 to 175·00
Kitul fibre per cwt	R28 00 to 30·00
Palmyra do do	R4·50 to 17·50
Jaffna Black Cleaned per cwt	R14·00
do mixed do	R12·00 to 13·00
Indian do	R8·00 to 1[illegible]·50
do Cleaned do	R10·50 to 17·50
Sapanwood per ton	R50·00 to 60·00
Kerosene oil American per cases	R8·[illegible]0 to 8·35
do bulk Russian per tin	R3·35 to 3·40
do Russian per cases	R6·75 to 7·00
Nux Vomica do per cwt	R2·00 to 3·50
Croton Seed per cwt	R30·00
Kapok cleaned f o b per cwt	R24·50
do uncleaned do	R6·00
Plumbago per ton, according to grade — Large lumps	R650·00 to 1000·00
do	R400·00 to 900·00
Chips	R250·00 to 650·00
Dust	R100·00 to 500·00

COLOMBO PRICE CURRENT.

(*Furnished by the Chamber of Commerce.*)
Colombo, 26th Feb. 1900.

CARDAMOMS:—
All round parcel, well bleached per lb. R1·70
Do. dull medium do. 1·50
Special assortment, 0 and 1 only do. 2 25
Seeds do. 1 40

CINCHONA BARK:—
Per unit of Sulphate of Quinine 12; 1 o/o to 4 c/o

CINNAMON:—
Ordinary assortment per lb. 60c. }
Nos. 1 and 2 only per lb. 66c. } Small supplies.
Nos. 3 and 4 only per lb. 54c. }

CINNAMON CHIPS:—
Per candy of 560 lb R95—Good supply.

COCOA:—
Finest estate red; unpicked per cwt R48·00
Medium do do per cwt R42·00 Nominal.
Bright native, unpicked and undried per cwt Nominal
Ordinary do do do Nominal

COCONUTS—(husked).
Selected per thousand R45·00
Ordinary ,, R41·00
Smalls ,, R28·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R80·00
Do. in bags none

COCONUT (Dessicated).
Assorted all grades per lb. 13¾c Nominal.

COCONUT OIL—
Dealers' Oil per cwt. R14·75—Sellers at R14·75
Coconut Oil in ordinary packages, f. o. b. per ton R330·00.—Sellers at R335·00

COFFEE—
Plantation Estate Parchment on the spot per bus. R9 00
Plantation Estate Coffee f.o.b. (ready) per cwt. R65
Native Coffee, f.o.b 42·00.

CITRONELLA OIL—
Ready do per lb. 65c—In drums of 800 lbs
do do per lb. —None

COPRA—
Boat Copra per candy of 560 lb. R45·50
Calpentyn Copra do do R46·50
Cart do do do R43 00
Estate do do do R46·50

CROTON SEED per cwt R30·00

EBONY—
Sound per ton at Govt. depot R175.—As per last Governmen Sales, Nov. 15th.
Inferior per ton at Govt. depot R120

FIBRES—
Coconut Bristle No. 1 per cwt R11
Do ,, 2 ,, 8·00
Coconut mattress ,, 1 ,, 2·75
Do ,, 2 ,, 2·00
Coir Yarn Kogalla ,, 1 to 8 18 00
Do Colombo ,, 1 to 8 16 00
Kitool all sizes 38 00
Palmyrah 16·00

PEPPER—Black per lb 28c.

PLUMBAGO—
Large lumps ,, per ton R1000 } Market
Ordinary lumps ,, ,, 900 } weak;
Chips ,, ,, 650 } Very Limi-
Dust ,, ,, 500 } ted transac-
Do (Flying) 200 } tions.

SAPANWOOD— per ton R60
SATINWOOD (ordinary) per cubic ft. R2·40

TEA—	High Grown. cts	Medium. cts	Low Grown. cts
Broken Pekoe and Broken Orange Pekoe per lb	52	41	34
Orange Pekoe do	52	40	34
Pekoe do	43	37	32
Pekoe Souchong do	38	31	28
Pekoe Fannings do	33	31	29
Broken mixed—dust, &c. per lb	28	27	25

CEYLON EXPORTS AND DISTRIBUTION 1899-1900.

COUNTRIES	Tea, 1900 lbs.	Tea, 1899 lbs.	Coffee—cwt. Plantation	Coffee—cwt. N'tive	Coffee—cwt. Total.	Cocoa cwts.	C'moms lbs.	Cinnamon. Bales lbs	Cinnamon. Chips. lbs.
To U K. ..	14739583	1162198	912	..	912	7880	52013	05135	24900
,, Austria ..	1617	727	..	..	..	..	..	..	..
,, Belgium ..	..	2683	27	..	27	63	...	16200	..
,, France ..	29494	31931	..	...	..	..	2323	5148	2
,, Germany ..	59929	38318	..	..	..	27	23900	65700	71750
,, Holland ..	..	..	..	..	..	..	...	..	11200
,, Italy ..	533	1040	..	..	..	...	...	28700	...
,, Russia ..	1280119	..	15	..	15	...	..	..	...
,, Spain ..	6970	..	..	...	..	..	..	1300	..
,, Sweden ..	13665	7228	..	..	..	...	560	...	..
,, Turkey .	5 51	3624	..	..	..	..	600	...	..
,, India ..	10 711	111471	26	..	26	..	17357	..	.
,, Australia .	193 9 1	2294 84	476	..	476	..	..	2700	7616
,, America ..	1193274	5035 9	9	..	9	278	...	101800	44800
,, Africa .	12710	11799	..	..	..	..	1120	..	2408
,, China ..	87343	188996	..	...	..	52	1800	...	...
,, Singapore ..	11006	14044	..	..	..	405	..	..	..
,, Mauritius ..	...	6170	..	..	..	..	...	...	..
,, Malta ..	3782	4391	..	...	.	..	..	..	.
Total export from 1st Jan. to 26th Feb. 1900	19569986	14842944	1465	..	1465	8705	99953	331023	162676

COUNTRIES	Coconut Oil. 1900 cwts	Coconut Oil. 1899 cwts	Copra cwts.	Desiccated Coconut lb.	Poonac cwts.	Coconuts No.	Plumbago. 1900 cwts.	Plumbago. 1899 cwts.	Ebony. cwts.	Sapan-wood cwts.
To U K. ..	22322	10404	633	887057	..	865671	14955	116 3	...	700
,, Austria ..	2220	851	260	..	...	..	.	..	..	260
,, Belgium ..		..	17974	...	14229	...	5791	3125	...	..
,, France ..	..	...	10274	2075	...	..	..	3106	220	..
,, Germany ..	2243	..	17255	60143	3513	100905	7873	10550	717	607
,, Holland ..	..	..	..	...	.	..	-	...	...	...
,, Italy ..	..	205	500	..	..	1050	...	.	..	...
,, Russia ..	..	..	24003	..	...	1590	...	..	..	..
,, Spain ..	..	..	..	...	...	..	..	...	..	..
,, Sweden ..	...	..	..	...	..	..	105	101	...	...
,, Turkey .	...	..	..	...	..	..	...	..	...	...
,, India ..	8826	3310	..	...	..	4700	..	57	..	23
,, Australia .	21	42	..	86272	..	..	210	1?0	...	.
,, America ..	24246	16037	..	480355	...	..	59 22	37172	..	..
,, Africa .	...	..	..	..	...	318525	..	..	..	...
,, China ..	..	2102	..	13220	...	..	..	..	..	...
,, Singapore ..	...	17812	..	...	..	..	...	..	...	..
,, Mauritius ..	..	..	...	...	..	...	..	...	..	...
,, Malta ..	...	...	...	..	..	..	..	..	..	...
Total export from 1st Jan. to 26th Feb. 1900	60378	55783	7894	1529155	17742	1232411	88256	63074	937	1090

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Prices Current, London, February 24th, 1900.)

☞ No Price Current having reached us by latest mail, we omit the usual quotations and fill with other matter.

THE VALUE OF THE PHILIPPINES.

AN ADDRESS BY SENATOR BEVERIDGE OF INDIANA.

"Mr. President, the times call for candor. The Philippines are ours forever, 'territory belonging to the United States,' as the Constitution calls them. And just beyond the Philippines are China's illimitable markets. We will not retreat from either.

"China's trade is the mightiest commercial fact in our future. Her foreign commerce was $285,738,300 in 1897, of which we, her neighbor, had less than 15 per cent, of which only a little more than half was merchandise sold to China by us. We ought to have 50 per cent, and we will. And China's foreign commerce is only beginning.

"The Philippines command the commercial situation of the entire East. Can America best trade with China from San Francisco or New York? From San Francisco, of course. But if San Francisco were closer to China than New York is to Pittsburg, what then? And Manila is nearer Hongkong than Havana is to Washington. And yet American statesmen plan to surrender this commercial throne of the Orient where Providence and our soldiers' lives have placed us. When history comes to write the story of that suggested treason to American supremacy and therefore to the spread of American civilization, let her in mercy write that those who so proposed were merely blind and nothing more.

"But if they did not command China, India, the Orient, the whole of the Pacific for purposes of offence, defence and trade, the Philippines are so valuable in themselves that we should hold them. I have cruised more than 2,000 miles through the Archipelago, every moment a surprise at its loveliness and wealth. I have rodden hundreds of miles on the islands, every foot of the way a revelation of vegetable and mineral riches. No land in America surpasses in fertility the plains and valleys of Luzon. Rice and coffee, sugar and coconuts, hemp and tobacco, and many products of the temperate as well as tropic zone grow in various sections of the archipelago. I have seen hundreds of bushels of Indian corn lying in a road fringed with banana trees. The forests of Negros, Mindanao, Mindora, Puauan and parts of Luzon are invaluable and intact. The wood of the Philippines can supply the furniture of the world for a century to come. At Cebu, Rev. Father Julio Segrera told me that forty miles of Cebu's mountain chain are practically mountains of coal. Pablo Majla, one of the most reliable men on the islands, confirmed the statement. Some declare that the coal is only lignite, but ship captains who have used it told me it is better steamer fuel than the best coal of Japan. I have a nugget of pure gold picked up in its present form on the banks of a Philippine creek. I have gold dust washed out by crude processes of careless natives from the sands of a Philippine stream. Both indicate great deposits at the source from which they come. In one of the islands great deposits of copper exist untouched. The mineral wealth of this empire of the ocean will one day surprise the world. I base this statement partly on personal observation, but chiefly on the testimony of foreign merchants in the Philippines who have practically investigated the subject and upon the unanimous opinion of natives and priests. And the mineral wealth is but a small fraction of the agricultural wealth of these islands.

"And the wood, hemp, copra and other products of the Philippines supply what we need and cannot ourselves produce. And the markets they themselves afford will be immense. Spain's export and import trade with the islands undeveloped, was $12,175,549 annually. Our trade with the islands developed will be $125,000,000 annually; for who believes that we cannot do ten times as well as Spain? Consider their imperial dimensions. Luzon is larger and richer than New York, Pennsylvania, Illinois or Ohio. Mindanao is larger and richer than all New England. Manila, as a port of call and exchange, will in the time of men now living, far surpass Liverpool. Behold the exhaustless markets they command. It is as if a half dozen of our states were set down between "Oceania" and the "Orient," and those states themselves undeveloped and unspoiled of their primitive wealth and resources. Nothing is so natural as trade with one's neighbours; the Philippines make us the nearest neighbours of all the East. Nothing is more natural than to trade with those you know. This is the philosophy of all advertising. The Philippines bring us permanently face to face with the most sought customers of the world. National prestige, national propinquity, these and commercial activity are the elements of commercial success. The Philippines give the first; the character of the American people supplies the last. It is a providential conjunction of all the elements of trade, of duty and of power. If we are willing to go to war rather than let England have a few feet of frozen Alaska, which affords no market and commands none, what should we not do rather than let England, Germany, Russia or Japan have all the Philippines? And no man on the spot can fail to see that this would be their fate if we retired.

"The climate is the best tropic climate in the world. This is the belief of those who have lived in many tropic countries, with scores of whom I have talked on this point. My own experience with tropical conditions has not been exhaustive; yet speaking from that experience, I testify that the climate of Iloilo, Sulu, Cebu and even of Manila, greatly surpasses that of Hongkong."

"Here, then, Senators, is the situation. Two years ago there was no land in all the world which we could occupy for any purpose. Our commerce was daily turning toward the Orient, and geography and trade developments made necessary our commercial empire over the Pacific. And in that ocean we had no commercial, naval or military base. Today we have one of the three great ocean possession of the globe, located at the most commanding commercial, naval and military point in the eastern seas, within hail of India, shoulder with China, richer in its own resources than any equal body of land on the entire globe, and peopled by a race which civilization demands shall be improved. Shall we abandon it? That man little knows the common people of the Republic, little understands the instincts of our race, who thinks we will not hold it fast, and hold it forever, administering just-government by simplest methods."

In closing the Senator said: "Mr. President and Senators, adopt the resolution offered that peace may quickly come and that we may begin our civilizing saving, regenerating and uplifting work. Adopt it and this blood shed will cease when these deluded children of our islands learn that this is the final action of the representatives of the American people in Congress assembled. Reject it, and the world, history and the American people will look where to forever fix the awful responsibility for the consequences that will surely follow such failure to do our manifest duty. How dare we delay when soldiers' blood is flowing."—*American, Manila, Feb. 10.*

THE

AGRICULTURAL MAGAZINE,

COLOMBO

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for March:—

Vol. XI.] MARCH, 1900. [No. 9.

THE COCONUT INDUSTRY IN CEYLON.

ALTHOUGH the coconut palm has been cultivated and has flourished in the Island for centuries, its products did not until recently take as prominent a part as might have been expected among exports. The explanation is that the palm is slow of growth, taking from five to fifteen years, according to the character of the soil, to come into bearing, and not being in full bearing till ten to twenty-five years. In these circumstances, European capital which expects quiet returns such as coffee, cacao, tea, and cardamons yield, has not been largely attracted to it; and the experience of European planters in the Northern and Eastern Provinces, where only very small profits were derived owing to the difficulties of transport, was not such as to encourage investors. What the native plantations yielded, lessened by the enormous claims of home consumption, was therefore practically all that reached the market and was available for export and for manufacture at the hands of British merchants. Within the past ten to fifteen years, however, there has been an immense development of cultivation, partly through the growth in knowledge and enterprise of the Ceylonese themselves, and partly through the appreciation by Europeans of the fact that, though the returns from coconuts are low, they are surer than from any other industry, and that as an investment there is nothing to equal palm cultivation. The following figures from the exports statistics of the Island will show at a glance the immense development there has been in the coconut industry:—

	1861. Cwt.	1861. Value. Rs.	1898. Cwt.	1898. Value. Rs.
Coconut Oil ..	83,605	1,010,430	435,933	6,684 306
Do Poonac ..	No record.		216.620	897,426
Copra ...	27,279	163,680	506,277	6,328,462
Coir ...	43,163	308,640	183,931	1,767,345
Desiccated Coconuts ..	Not established		116,433	2,342,971
	Gals.		Gals.	
Arrack ..	393,355	267,870	65,902	153,064
			Nuts.	
Coconuts ..	—	79,960	12,027,714	541,247

The foregoing figures show not only the great advance made by every product of the coconut palm since 1861, but also the new uses to which the nut and its products are put. Thus, in 1861, either there were no exports of poonac (the kernel refuse after oil is expressed) or they were so small as not to be worth recording. Now they are sent away by thousands of hundredweights to various parts of the world, chiefly Europe, to fatten stock. The trade in desiccated coconuts is of very recent growth, and the exports have found a place in the commercial tabular statements only since 1891; now the kernels of about 40,000,000 nuts are annually deprived of their moisture after being sliced in desiccators, and packed in lead-lined boxes are sent to all parts of the world, including France, to be used for confectionery, &c.

The above items, however, do not exhaust the list of the products of the coconut palm sent away from the island. There is a trade in cadjans (or thatch) and mats made of the leaf, in coir mats and rugs made of the husk, in laths and rafters made of the wood, and in a variety of articles, useful and ornamental, made of the shell. Altogether the value of the exports of the products of the coconut palm cannot be far short of 19 million

rupees a year or 30 million francs. Nor, again, does this represent in any way the value of the coconut industry to the Island. It is the only great agricultural product whose home consumption is even larger than the export trade. It is impossible to state accurately the value of the products of the coconut palm used by the people of the country, in the construction of their houses and huts, in domestic utensils, in trade implements, in food, in drink, in medicine, in the absolute necessaries of tropical life, in luxuries, but, even on the moderate calculation that a family uses 1½ nut a day, the 700,000 families of which the 3½ million people in the island may be said to consist, would consume 383½ million nuts. A calculation of the exports of last year showed that nearly 400 million nuts were sent away in the husk, in the shell, as oil, and after desiccation; so that the production of the Island cannot be less than 800 million nuts.

It is estimated that, including dwelling gardens, about 700,000 acres (280,000 hectares) are planted with the coconut palm. This acreage, at 75 trees to the acre and 20 nuts to the tree, should yield 1,050 million nuts; but a large number of trees are reserved for toddy drawing, and the distillation there from of the spirit known as arrack. The value of the arrack consumed in the Island (over a million gallons) has been computed in a recent official paper at R7,629,067, and of this sum the Government now receives R3,000,000 a year, or one-eighth of the total revenue, by the sale of the monopoly of retailing the spirit to "renters." The importance, therefere; of the coconut industry to the people and to the country is beyond controversy; and the growth of the industry is steadily maintained.

PRACTICAL HINTS TO HORSE OWNERS.

By A. Chinniah, G.B.V.C.

INTRODUCTION.

Ever since I started practising I have observed that it is very difficult to explain anything based on the rational practice of Veterinary science to a client who is not a horseman. Empiricism is all that is known to such. The empiric is always ready to put down anything and everything rational. The battle between empirism and rationalism will (as in the case of human medical practice) go on till people are forced by bitter experience to abandon the former for the latter.

As these hints are mainly intended for laymen, it is my desire to avoid technical language as much as possible, but if such terms are unavoidable, they will be explained in footnotes.

Chapter I.—STABLES.

Situation.—The stables should be located on a spot well raised from surrounding land, so that the floor will be as free as possible from moisture. It is important to see that no hindrance to the proper circulation of air is possible, and there is no reason why the stables should not be as well constructed and well placed as the master's residence, in point of aspect, situation and proper elevation. The distance from the other buildings to the stable should be at least 50 yards.

Floor.—Many horse owners in Ceylon favour granite or cement floors for their animals. The preference to this kind of floor is no doubt because it could easily be kept clean. The disadvantages of such flooring are, however, great, and hence their use should be discontinued. Brittle hoof, sand crack, sprains, &c. are the diseases that are brought about by such hard floors.

The best and the cheapest flooring for a horse's stable should be of earthy material, which is a poor conductor of heat and cold. Again, an animal when standing stamps his feet a good deal, and if this goes on on stone or cemented floors, the concussion is greatly felt; but when the texture of the material used is of a yielding nature, it is modified to a great extent. For the tropics a clay floor is the best, and it should be made as follows:—

For the top layer (to a depth of 6 or 8 inches) two parts of fine clay mixed up with one part each of sand and lime should be used. But the lower stratum should be made of good cabook or clay.

The clay or cabook should be spread over a depth of one foot, without any water being added and rammed in with a block of wood. After a day some water should be sprinkled over in the evening. The next morning more earth should again be rammed in and watered in the evening, and on the third day the same process should be repeated. The top layer (the composition of which is given above) should be spread over then, and treated after the same fashion for about three days, and then allowed to dry for three weeks, so that one full month is required to make a floor.

A floor made in this way will be found most satisfactory, but to keep it in good condition is very difficult, unless it is well looked after.

There are some animals that never stale unless they are taken out of the stable. This is an excellent habit, and one which should, if possible, be inculcated. The practice which is sometimes adopted of catching the urine in a bucket or chatty is a good one, but if this is not carried out earth should be sprinkled over the wet ground to absorb the moisture, and the spot brushed clean. The spots stained during the night should be scraped and then filled up with powdered clay, and patted down smooth. A boxfull of dry earth should be kept in a corner of the stable for this purpose.

The slope of the stable should not exceed 1 in 80; if above that it produces sprain, weakness of the loins, &c.

(*To be continued.*)

MODERN AGRICULTURAL SCIENCE.

The *Nineteenth Century* for November last contains an interesting and instructive article referring to a series of useful Agricultural Experiments, which are calculated to throw a good deal of light on agricultural practice:—

Some eighteen years ago the two founders of that New Soil Science were attracted to the study of soil bacteriology. One of them wa

Mr. John Hunter, F.I.C., F.C.S., Chemical Analyst and Lecturer on Agricultural Chemistry and Brewing Science. The other was Professor McAlpine, Lecturer on Botany and Botanical Adviser to the Highland and Agricultural Society of Scotland. The discoveries of Pasteur and other investigators as to the paramount importance of having the right crops of yeast plants in the production of beer were doubtless the means by which Mr. Hunter was led to recognise the equally great importance of having in the soil the right crops of soil bacteria. The nodules on the roots of the leguminosae were first investigated by Messrs. Hunter and McAlpine, and, as the results of a careful series of investigations and experiments, they demonstrated the fact that the bacteria in these root nodules did possess the power of absorbing the "free nitrogen" of the atmosphere and rendering it available for the use of the plant. The discovery of this property on the part of the nodule bacteria is usually ascribed to Hellriegel, but years before Hellriegel announced his discovery in 1886, Messrs. Hunter and McAlpine were teaching the same fact to their students, as the lecture notes of any of their students at that time can testify. After investigating the nature and functions of the bacteria in the root nodules of the leguminosae, Messrs. Hunter and McAlpine proceeded to carry out a series of investigations in regard to the nitrifying bacteria. At an early stage of their investigations they found there were several well-defined sets of bacteria concerned in the work whose final end is nitrification. They succeeded in isolating and cultivating the nitrous germs, and they also isolated what they believed to be the nitric germ, but in the case of the latter germ they were for a time puzzled to find that they could not from it, in any ordinary culture media, produce nitrates. By a happy inspiration they remembered the plan by which Napoleon was able to secure from the old mortar in the Paris stables a supply of nitrate for the manufacture of gunpowder, and they accordingly added a small supply of mild lime in the form of garden wall mortar to the culture media, with the result that the nitric germs produced nitrates speedily enough. These experimentors knew well enough before then that caustic lime would destroy the soil bacteria, and they therefore taught that the old plan of applying a heavy dressing of four to six tons per acre of hot lime was a huge mistake, while on the other hand a small annual, or at the outside biennial dressing of lime compost to the surface soil, where bacterial life was most active, was essential in successful and scientific manuring. They also found that these lime compounds in the surface soil served a further important use by preventing the soluble silicates being taken up by the roots of the plant, as these soluble silicates were taken up by the lime, and still more readily by the magnesium obtained from the lime, and then formed insoluble silicates which were retained in the soil, and did not diffuse into the plant, so that there was produced a non-silicated stem, or in the other words a cellulose stem, which would bend without breaking in the wind, while the non-silicated straw was much superior in value to the silicated straw. They ridiculed the old idea that soluble silica built up in the tissue of the plant gave strength and solidity to the stem, and they pointed out that silica was, to all intents and purposes glass, so that straw with a backbone of silica was a brittle substance which was very liable to be broken and lodged by the wind, and moreover was of very inferior feeding value. They also found that just as in the manufacture of beer or whisky, or in fact in any process of fermentation, great quantities of carbonic acid were produced, so through the operations of the soil ferments great quantities of carbonic acid were produced in the soil, and one great function of subsoil drains was to provide an outlet for the great amount of carbonic acid produced in the soil through the operation of the soil ferments. The same line of reasoning went to show that the commonly accepted doctrine as to capillarity required to be recast, and in fact that the whole of the old system of agricultural science as taught in the text-books commonly used, required to be pulled down and built up anew on a biological basis.

(*To be concluded.*)

THE SOLUBLE MINERAL MATTER OF SOILS.

By THOMAS H. MEANS,

Assistant in Division of Soils U.S. Department of Agriculture.

If a piece of granite be exposed to the weather for a long time, changes will be noticed gradually taking place. The rock will whiten and finally fall to pieces, leaving a coarse powder without the slightest resemblance to the original rock. If the rock is weighed, it will be found that some of the material composing the rock has disappeared. This process of the breaking down of rocks has been going on for ages unnumbered, and to-day nearly all of the rocks are covered with a layer of rock powder or soil. While the rock is breaking down, or weathering, as it is termed, mosses and lichens begin to grow, and, as they die and give place to other plants, their remains decay and leave in the decomposing rock the black coloring matter which is called organic matter, and which in certain stages of decomposition is called humus. When the rock is all broken down and the organic matter, together with the humus, is mixed with the rock powder, there remains what is termed a soil.

Many chemists haved studied this weathering of rocks and the formation of soils, and all of them agree that in the process large quantities of the materials in the rocks are so changed by the weathering that they are rendered more or less soluble in water; then as the rainfall penetrates the rock and the rock powder, this soluble matter is gradually dissolved and washed out, accounting for the loss in weight of the decomposing granite.

Dr. George P. Merrill, of the United States National Museum, has examined a large number of rocks and soils, and has determined that rocks lose by solution from 10 per cent to as much as 98 per cent of their weight in passing from the solid rock to soil, that is to say, in the formation of an acre of soil one foot deep from 200 to 86,000 tons of the rock are removed by solution,

Rocks are composed of various materials, some of which in decomposing or weathering yield large quantities of soluble matter, while others yield little or no readily soluble matter; so that the rock is not dissolved as a whole, but the chemical action of weathering so changes some minerals that parts of them are made soluble. Thus feldspar, a common constituent of many of our rocks, is not soluble in water, but as weathering goes on under the atmospheric conditions, the mineral whitens, breaks down, and the insoluble kaolin (clay) and silica (sand) are left, while potassium carbonate is washed out in solution. On the other hand, quartz, the most common of all minerals, does not change during the weathering, but simply breaks up into finer particles of sand, very little of which is removed by solution.

With the formation of the soil this process of solution and removal does not cease, but as long as water is in contact with the soil grains there are chemical changes taking place and salts are being dissolved. Pure water will dissolve as much as one per cent of some of our soils, but the average amount dissolved will be much less than this, probably nearer one-tenth of one per cent.

The soils, like the rocks, are composed of various materials, and the water dissolves these just as it did the minerals of the granite. Some of the minerals contain plant food, some do not, and when all of the minerals containing plant food are dissolved and washed away, the soils become sterile and will not support plant growth. Plants need only a very small amount of mineral food at one time, but this small amount must be supplied throughout the growing season.

A number of chemists have made chemical analyses of the matter dissolved by water in various soils. They have shown that all of the minerals are more or less dissolved by the water, and that the solutions contain all of the mineral ingredients of a plant. The important plant foods, phosphorus, nitrogen, and potash, are present in small quantities in the solution, while lime is present in a much larger quantity in most soils. Should the plant foods be present in solution in large quantities, the first heavy rain would wash all out that were dissolved, and their value would be lost. The examination of large numbers of samples of drainage water has shown that phosphoric acid and potash are only washed out in small quantities, while nitrogen is removed nearly as fast as formed within the soil.

It was noted many years ago that a soil possessed the property of decolorizing solutions and of rendering foul water pure. This is well illustrated in our common custom of digging wells; the deeper the well the purer the water and the less liable to contamination from surface impurities. This simple fact of the power of sand or soil to take the coloring matter out of manure extracts was noted by chemists, who found, on further examination, that the phenomenon was much more general and of a far larger interest than was first supposed. It has been found that all soils possess this property to a greater or less extent. They remove soluble matters from solution and gradually release them again, so that at no time is any large quantity of matter present in solution. When a solution of potassium nitrate is poured through a soil the potassium is in a large measure absorbed and retained, while lime takes the place of potash in solution and is washed out as the nitrate of lime. Soils, in other words, decompose the salts and retain the alkaline portion (potash, soda) with the phosphoric acid, while the acid portions (nitric, muriatic, sulphuric, etc.) are removed with part of the alkalies and lime.

The great importance of this fact to the agriculturist can readily be seen. When a mineral fertilizer is applied to a soil, instead of being all dissolved and remaining in solution to be washed down into the subsoil by the first heavy rain, the plant foods are absorbed by the soil and gradually supplied for the use of the plant roots.

During a study of the soluble matter of soils in the Division of Soils several new methods and new apparatus have been used, and the results obtained have been of much interest to those engaged in agricultural research as well as to the practical agriculturist.

The soluble matter of soils may be classed under two general heads, (1) soluble mineral matter and (2) soluble organic matter. Under the first head are classified all salts and soluble compounds derived from the decomposition of rock or mineral parts of the soil. Under the second head are classified all soluble matter derived from plant and animal remains. The study has been confined almost entirely to soluble mineral matter, and only this class of soluble matter will be considered here.

There are three conditions in which a salt can exist within a soil, (1) insoluble; (2) soluble; (3) absorbed—physical and chemical absorption. Of these three conditions the first, in which the salts are insoluble, is of importance as a reserve, for there exists in this condition all of the undecomposed minerals with their stores of plant food. The term insoluble is used in a relative sense, for all the minerals are soluble in water to a slight degree. These minerals are constantly being decomposed, thus yielding their store of plant food in a more available condition for plant growth and furnishing supplies for continued fertility for a long or short time, accordingly as the soil contains much or little plant food locked up in insoluble form. In the second condition, in which the salts are actually in solution, they are, of course, in a condition in which the plant can most readily use them.

The absorption of salts has been briefly discussed in an earlier part of this paper. The condition of absorbed salts is one which has received much attention in recent years. There are two kinds of absorption, chemical and physical. The chemical absorption has already been treated in another paragraph, and the description which follows refers to the physical absorption. Any solid body placed within a solution has the power of absorbing or condensing upon its surface matter which is in the solution. These salts when absorbed or condensed seem to have little effect upon the growth of the plant. They are very slowly given up by the solids to the solution again as the soil is leached. Such physical absorption or condensing action varies with the condition of the surface, that is to say, whether it is rough or smooth, compact or porous, and it aslo varies with the extent of the surface.

Some salts seem to be more readily absorbed than others. In order to test the relative absorption of various salts which are found in soils, some experiments have been conducted upon the rapidity with which various salts could be washed out from a soil, in which there was no chemical action, but in which the salts were physically condensed, or absorbed bodily, much as a sponge absorbs water. The relative time of washing out the various salts was as follows.—

Relative time of leaching salts.

	Minutes.
Calcium chloride	1
Sodium chloride	2
Magnesium chloride	2
Potassium chloride	4
Ammonium chloride	8

In this experiment there is the foundation of some of the most important principles regarding the removal of any accumulation of salts. It is seen that the calcium salt was most readily washed out, while the ammonium and potassium salts were the hardest to wash out.

A LETTER ON RABIES.

DEAR SIR,—The following observations should be of interest to your readers, as cases of rabies may be said to be of daily occurrence in Colombo.

This formidable disease has a terrible importance, since it annually claims human victims in considerable numbers.

The symptoms induced by it are very painful for both onlookers and friends of the sufferer to witness.

There are two forms of rabies, the dumb and the furious. The cause is through inoculation by a previously rabid animal. In the early stage there is rise of temperature and all febrile symptoms. The dog seeks hiding places for itself.

In the dumb form of rabies the animal's eyes are dull, while there is a general distressed appearance, dark-coloured tongue and pendulous tongue and lower jaw. In this form the disease runs its course with special rapidity and paralysis supervenes. Face, back and hind limbs are successively invaded until at last the animal becomes completely paralysed.

There is gastric derangement and in some instances spasm of the digestive organs. The animal may collect straw, bedding, stones, &c., and press on it with a view of relieving these spasms. In one case in which I performed a post-mortem examination I observed an abscess formed on the belly which I attribute to the abovementioned fact.

In the early stage of the disorder there is increased sexual excitement and bitches are much less liable to be bitten than dogs. The howl of the mad dog, if once heard, will never be forgotten, and any description must necessarily be insufficient to convey its true character. It is an imperfect bark, followed by incomplete howls. The dog licks and bites himself and especially at the seat of inoculation, which is very irritating.

Any strangeness in the behaviour of a dog must be observed with suspicion. It is remarkable that in rabies the owner is the last person injured.

In the furious form the paroxysm of rabies is well-marked. The animal lies quietly when not excited; it dozes or sleeps soundly, but, if awakened, rises in a fury. "The wrath of the patient varies in different individuals and stages of disease; it either assumes the form of a blind fury, prompting the dog to fly at and worry any strange object, such as a stick inserted through the bars of his cage, or there seems a sort of 'method in his madness' which has been considered an 'instinctive desire to propagate the affection,' thus dogs are the special objects of aversion, and cats too excite the animal to fury, but later herbivora and then men come on the list of those to whom he will do mischief. It is remarked that in the case of rabid herbivora the greatest fury is felt toward dogs, and this is sometimes seen in the case of human beings. The fury is preceded by a period of strange restlessness, a quickness and irritability of the temper, and sometimes a remarkable amount of treachery. The animal is dull but watchful, and a very characteristic symptom is a tendency to snap at flies or other real or imaginary objects, after watching their course for a little time, as though to obtain a favourable opportunity for the act of aggression. While dozing between the paroxysms the animal often starts up suddenly and wildly."

After the febrile stage in the dumb form, the animal becomes paralytic, but in the furious form he is so much stimulated that he could traverse enormous distance. The pace adopted is a slow, dogged sort of trot; at first the animal may go from side to side, biting everything and anything he meets in his track, but soon he goes straight forward, attacking when opposed, and so it is essential that when we notice a rabid dog we should keep out of his path. Latterly the dog becomes exhausted, paralytic and dies.

Rabid animals drink water freely till the loss of swallowing power seen in the later stages. Even then he will endeavour to slake his insatiable thirst. The term Hydrophobia is a misnomer. There is profuse salivation only in the early stages, not lasting more than a couple of days, and there is vomition in the early stages. Foreign matter such as straw, hair, &c., are accumulated in the pharynx and stomach. It is due to the perverted appetite. Male dogs are most often affected. It is essential in this connection to mention that the saliva of a rabid animal, not necessarily through a bite, falling on the abraded surface of the body is quite sufficient to communicate the disease.

Neither man nor domesticated animals (quadrupeds or birds) are capable of resisting rabies inoculation. Any rabid animal, not only a rabid dog is capable of transmitting the disease to man and other animals.

Dog bites are generally inflicted on the legs except in the case of children, for they are more often bitten in the hands or face. A bite on the face takes a shorter duration to develop the symptoms and a bite inflicted over a protected part, unless such protection is very thin (such in thin trousers or cloth) there is very little likelihood of getting the virus.

The muzzling of dogs, especially during an epidemic of this nature, is very necessary, especially

in the case of the pariah dogs whose home is on the streets. The muzzling should be slackened when the epidemic passes away, for a watch or hunting dog, and in fact any dog is no dog with a muzzle on.

Yours truly,
A. CHINNIAH,
Veterinary Surgeon.
Mango Lodge, Colombo, December 22nd, 1899.

THE CLASSIFICATION OF FIBRES.

(DR. DODGE.)

Among the many wants of man there are two which in all ages and in every clime have been regarded as necessities—food and the covering of the body. The first is an absolute essential to life; the second, an adjunct either to comfort or appearance. In supplying the second necessity man has used the bark, stems, leaves and roots of trees, shrubs, vines, grasses and the fibrous growth often provided by nature to protect their fruits during the period of development; he has employed the skins of animals, their shorn hair or wool, and, lastly, the cocoons of the silk-worm. At first vegetable substances could scarcely have been employed, for primitive man was satisfied with the skin of an animal girded about his loins; but in time, with the dawn of creative intelligence, the filaments of bark and wool and hair were rudely twisted into threads and coarsely woven. These fibres twisted again into larger threads, as fish lines, when knotted together formed fish nets, with which he was enabled to secure food, or a number of these threads wrought together made him cordage. His wants increasing as his inventive faculties were more and more developed, and as he became more intelligent, he felt the need of various utensils in the domestic economy, and pottery, trays and baskets were fashioned from clay, from twigs of bushes or trees, from rushes and the leaves of palms and similar plants. And when canes or overhanging cliffs and rock shelters ceased to be his protection from the elements he learned to build huts and to tatch them with palms and grasses. Having now entered upon a domiciliary existence and new wants being created, mats and screens were woven from seeds and sedges or from strips of palm, and primitive man had entered upon a kind of barbaric civilization. Aboriginal man is primitive in all ages, and the age of his particular race and his environment fixes the scale of his civilization. If, in the early Stone Age, he threw across his shoulders or girded above his loins the skin of an animal slaughtered for food, it was because such rude dress satisfied his simple wants in this direction. And there are native tribes in Africa and Australia at the present time with no higher desires as to their raiment and who still dress in skins, and African Tribes who still adhere to Adam's costume—not fig leaves, but a girdle of evergreens and creepers or a leafy branch, as in the Obbo Tribe. But the economic uses of plants were bound to be learned by savage man in time, and skill was early acquired in preparing them for use. We find, therefore, among the uncivilized races all over the world that many species of fibre plants have become most useful for utensils, cords, and clothing which civilized man with all his intelligence and inventive genius cannot afford to employ commercially. It is true that the recognized commercial fibres represent those best adapted for use, and that many of them like flax, hemp, and cotton must be classed with the fibres of antiquity. They have established their places because they have been proved to be the best for the purposes for which they are employed and the others can only be considered as their substitutes or as simple "native" fibres. We have therefore two natural groups of fibres—the commercial species with their substitutes which are soon enumerated, and the vast group of the so-called native fibres, many of which might fitly be termed emergency fibres, because they are extracted and used at the moment when needed. These so-called native fibres are also interesting, however, and through our knowledge of some of them, or when a species finds its way to the outside world, a new commercial fibre now and then is brought to light. They are legion when taken collectively, and therefore in enumerating the many species found in the countries of the globe, it is very easy to secure a list that can only be stated in four figures.

We have seen that different forms of cellular structure compose the fibres derived from dicotyledonous and monocotyledonous plants, as well as the seed hairs, or other hairs, from certain species of both divisions of the vegetable kingdom. In general terms, therefore, fibre is composed of bundles of bast or fibro-vascular tissue in the form of long flexible filaments, such as flax, hemp, or manila, or of hairs such as cotton, capable of being twisted or spun into threads or yarns, to be subsequently manufactured into cordage or fabrics. In the economic employment of fibrous vegetable material it is often the case that the fibre bundles are not separated or sub-divided into such delicate filaments as compose the cleaned fibres of flax and hemp, but are used in a conglomerated mass, or even in a more primary form, as the whole stems of seeds or grasses, as in matting manufacture, where both fibrous substances and the celluar tissue and woody waste is used without further preparation than drying. Or, still broader differentiation is found in the employment of palm leaves torn into strips or the woody stems of such plants as the willow and sumac, which are coarsely woven or plaited into baskets and similar objects. These fibrous substances, however, are not always utilized by subjecting them to the operations of twisting, spinning, plaiting or weaving, but are employed in a mass as upholstery material for the stuffing of cushions, mattresses, and the like. Beginning with true fibrous material, such as tow or the waste from scrutching flax, hemp, &c., and the seed hairs of the many plants known as cotton and silk cotton, and coming down through the list we discover the use of mosses, leaves, and even finely sub-divided wood shavings or 'excelsior' as forms of stuffing or packing material. The last named are not fibre, though on account of their economic employment they are regarded as the substitutes of fibrous substances. Therefore, in considering the many species of plants which are employed for so many different uses in the industrial economy, one species oft-

times being utilized as a cheaper substitute for another, in order to show their relations, both botanically and economically, a division into classes is necessary, that the place and value of each form of fibre may be readily recognized. Several classifications will be found in the works relating to this subject, but after reviewing the 1,000 or more species of vegetable fibres and fibrous substances comprised in this catalogue, a new scheme of classification, considered chiefly from the economic stand-point, has been devised, and is presented as both simple and natural.

DETERMINATION OF AGE BY TEETH IN DOMESTIC ANIMALS.*

Horse.—The horse has 24 temporary teeth. The male has 40 permanent teeth; the female 36 or 40. The smaller number is more usual in females, due to the lack of the tusks. The temporary teeth consist of 12 incisors and 12 molars; the 4 centre front teeth, 2 above and 2 below, are called pinchers; the next 4 are called intermediate or lateral, and the next 4 corner teeth. The permanent teeth consist of 12 incisors, 4 tusks, and 24 molars. The dental star is a yellowish ring appearing next the enamel on the table or crown of the tooth. The following table shows approximately the changes of the teeth with age:—

3 to 10 days: Temporary pinchers and 3 molars cut.
40 to 60 days: Temporary intermediates or laterals cut.
6 to 9 months: Temporary corner teeth cut.
19 to 25 months: Leveling of temporary corner teeth.
2½ to 3 years: Pinchers replaced by permanent teeth.
3½ to 4 years: Intermediates or laterals replaced.
4 to 4½ years: Tusks cut.
4½ to 5 years: Corner teeth replaced.
5 to 6 years: Leveling of lower pinchers.
7 years: Leveling of permanent intermediate.
8 years: Dental star and notches in pinchers.
9 years: Dental star in intermediates.
10 years: Dental star in corner teeth.

Cattle.—Cattle have 20 temporary and 32 permanent teeth. The temporary are 8 incisors in the lower jaw and 12 molars. The permanent teeth are 8 incisors and 24 molars. Cattle have no incisors in the upper jaw. The table for cattle is as follows:—

At birth: Temporary incisors appear.
5 to 6 months: Teeth decayed on border.
6 to 7 months: Leveling of pinchers.
12 months: Leveling of first intermediates.
15 months: Leveling of the second intermediates.
18 months: Intermediate incisors become stumps.
2 years: Permanent pinchers cut.
2½ to 3 years: Permanent first intermediates cut.
3½ years: Second intermediates or laterals cut.
4 years: Corner teeth replaced.
5 to 6 years: Leveling of permanent pinchers.
7 years: Leveling of first intermediates.
8 years: Leveling of second intermediates.
9 years: Leveling of corner teeth.
10 to 12 years: Dental star in pinchers and intermediates.
13 years: Dental star in corner teeth.

Sheep.—Sheep have 20 temporary and 32 permanent teeth. The table for changes is as follows:

1 month: Milk incisors appear.
3 months: Milk incisors decayed on border.
15 months: Permanent incisors cut.
2 years: First permanent intermediates cut.
33 months: Second permanent intermediates cut.
40 months: Corner teeth cut.

Hogs.—Hogs have 28 temporary and 44 permanent teeth. The table for changes is as follows:

At birth: Temporary corner incisors cut.
1 to 2 months: Temporary central incisors cut.
3 months: Temporary lateral incisors cut.
9 to 12 months: Permanent corner incisors cut.
12 to 15 months: Permanent central incisors cut.
18 to 20 months: Permanent lateral incisors cut.

* Exact correspondence of the condition of an animals's teeth with its age is, of course, not to be expected. It is only hoped that the tables here given, and approved by the United States Bureau of Animal Industry, will aid in forming a reasonably accurate opinion in any actual case.

EVERYDAY HINTS FOR POULTRY KEEPERS.

ASHES UNDER THE ROOSTS.

Among the very best materials to spread under the roosts in the poultry houses are sifted coal or wood ashes. While they do not absorb as much ammonia as dried earth does, they answer the purpose well enough if used in sufficient quantity.

HOW TO KEEP EGGS FOR HATCHING.

As much as possible eggs for hatching should be kept so as to prevent the evaporation of moisture through the pores of the shell. If the eggs have to be kept any length of time, I have found it a good plan to place them in a box with plenty of bran; some people prefer that the large end of the egg should be upwards.

A BREED SUITABLE FOR MARKET.

Those who wish to raise compact, heavy, finely-trained broilers or fowls for market should try Dorkings. A cross of a Dorking cock on large hens, especially Brahamas or Cochin, makes not only a heavy carcass, but an attrractive one. Young hens in laying, excel in quantity, though perhaps their eggs are inferior for hatching purposes.

EGGS FOR HATCHING PURPOSES.

It is advisable to keep eggs intended for hatching above the freezing point, as when thoroughly

chilled the germ is either killed or so badly injured that the chick dies in the shell, or immediately after it is liberated. The egg should be turned once a day, to prevent the yolk setting and adhering to the shell.

NEW QUARTERS FOR POULTRY.

One mistake in poultry-keeping is in running the hens on the same plot of ground continually. It is stated that they will not do as well in the same quarters after running there a few years. That has been the experience of many, and they come to the conclusion that some cheap, but warm, shelter should be made, and every few years removed to an entirely new spot.

CLEANSE YOUR HOUSES.

Spray the hen houses with kerosine, says the "Rural Australian." This is better and cheaper than whitewash. A spraying bellows will soon pay for itself. The spray penetrates every crack and crevice, and it is so fine that a very small quantity of kerosine serves for a given surface. This method of cleansing hen houses is cheap and effectual.

CUT THE WINGS.

It will do a hen no harm to have her wings clipped if she is a tramp, and it will prevent her from visiting the garden as often as usual. The proper way is only to cut one wing. The two longest or flight feathers may be left, cutting all the shorter ones. When her wings are folded the shortened feathers will not be seen.

DON'T STARVE THE FOWLS.

Hens that are starved seldom lay, and hens that are made and kept too fat never lay. The way to be sure of eggs is to strike a happy medium between the extremes, and keep them in good condition. It is not often that poultry need stimulants, and when they do it is from a lack of good attention, pure water, clean food, and clean quarters. It is not often that disease in any form attacks well-kept poultry yards.

SOFTSHELLED EGGS.

In the majority of cases softshelled eggs are caused by the hens being too fat. To remedy this stop feeding corn, and furnish wheat, oats, and barley. If the cause is simply a lack of lime, place old plaster, pulverized bones, or crushed shells, where the hens can pick at them. A little air-slacked lime can be put in the drinking water until the evil is remedied. Crushed bones, green or dry, is an excellent egg-producing food.

THE VALUE OF DRY LEAVES.

A correspondent in an American paper advises the readers to gather fallen leaves before they get wet and sodden, and store them in a dry place. There is nothing like dry, dead leaves in the poultry-house or shed. The hens will scratch them over and over again, until they (the leaves, not the hens) are worn out, and the exercise the hens get in scratching is what they need to keep them in good health, while necessarily confined to their limited winter quarters.

THE CAUSE OF MANY DISEASES.

It is not cold so much as dampness that brings about disease in the poultry-house. A duck will stay in the water half the time, and be perfectly healthy, but compel them to remain in a house on nights in which the floor is damp, and in a little while they will show the effects of it. Chickens can stand a hard rain occasionally, but a house that is damp and full of bad odours is a regular death-trap, and a breeder of diseases. Half the diseases of poultry are directly traceable to damp houses, and compelling the chickens to roosts where the air strikes them through cracks and crevices.

CHANGE THE FOOD.

Variety of food is absolutely essential to hens; but that is not a good arrangement of the variety which provides corn this week, bran next week, oats the next week, and wheat the following week. These are all good, but should be given at proper periods of the day, rather than during the several weeks of the month. Corn affords heat, and is fat-producing, and should be given sparingly the last thing in the evening so as to supply nourishment and warmth during the cold winter nights. The bran, with table scraps thrown in and all mixed with warm water, is best in the morning, and the wheat and oats should be in places where the fowls can scratch for them during the day.

FOUR FACTS.

In his work on poultry, Mr. Lewis Wright states the following are four facts gathered as the result of careful experiment and enquiry:—"1. The eggs of a young pullet are generally longer and more pointed at the small end than those laid by the same bird either later in the season or the next year. 2. These early pullets' eggs will produce, on an average, about the proportion of six cockerels to four pullets. 3. Eggs laid early in the season by older hens are also, as a rule, perceptibly longer and more pointed than those laid later in the season. 4. It is well known that cockerels oftener predominate in early broods and pullets in later ones.

NATURAL AND ARTIFICIAL RAISING.

The opinion is gradually gaining ground that chicks raised by hens are superior to those brought up in a brooder, says the "Farmer." It makes but little difference whether they are hatched under a hen or in an incubator, but no brooder has yet been made that will approach the hen for comfort. The fact that the hen that steals her nests, hatches and raises more chicks than those that receive so much attention is argument sufficient in favour of the hen over the brooder. One trouble with many persons is that they continually annoy setting hens in making them comfortable. This is especially true when the eggs are high-priced. An old, setting hen is a good deal like Little Bo-Peep's sheep:—"Leave them alone, and they'll come home, carrying their tails behind them."

CREAM CHEESE.

The following recipe is taken from the *Agricultural Gazette* (London):—

Take one gallon of sweet cream in a glazed earthenware vessel, heat to a temperature of 68 degrees to 70 degrees. If taken from a separator allow cream to stand from four to six hours to ripen. Add 15 to 20 drops of Hansen's rennet diluted with a little water; stir this in for 10 minutes, afterwards covering the vessel, and allow it to stand for 24 hours undisturbed in a temperature of 60 degrees; after this time it should be coagulated about the consistency of Devonshire clotted cream, and should be turned into a cloth and hung inside a vessel to drain in a circulating atmosphere of about 60 degrees. The cloth should be of coarse huckaback towelling, as it is thick enough to retain the cream and at the same time allow the whey to drain. The draining should continue for 18 to 20 hours, and during this time the cream should be scraped two or three times from sides of cloth to faciliate the separation of moisture. After this it should be turned into a fresh cloth and placed under weights of from 8 lb. to 12 lb. until dry enough for moulding, which generally takes from 8 to 10 hours. Before moulding, salt should be added at the rate of 1½ oz. to 2 oz. to the quantity.

On the same subject a lady writes to the *Cape Agricultural Journal*—

When in England I was for several years in the habit of making these cheeses three and four times a week.

This was not done at a public dairy, but was carried out on a fairly large scale on a farm then occupied by my husband.

I had several small wooden vats, about 6 inches long, 4 inches broad, and about 2½ inches deep. Small holes were bored in the bottom of the vats to allow the moisture to escape.

In the bottom of the vats was placed a strainer which had previously been wrung out in hot water—as hot as possible. After adding a small quantity of salt the cream was placed on that strainer, and another strainer (similarly prepared) was put on the top, laying it on the cream.

These strainers were changed night and morning, the fresh ones having of course undergone the scalding process, and this practice was continued until the cheese had arrived at the proper consistency. The time would necessarily vary according to the weather, but I usually looked for results after about three or four days.

The suggestions given in the *Journal* as to the addition to the cream of new milk, sugar, and rennet evidently refer only to the making of what is termed a new milk cheese, but that is a wonderfully different article from a *pure cream* cheese, which is indeed a great delicacy, and one which, in a climate such as that of South Africa, ought to be able to command very remunerative prices.

[We should like to see some of our upcountry dairies try cream-cheese making, for which there should be a demand; it might perhaps turn out to be more remunerative than butter making. Soft cheeses are made in India and sell fairly well.—ED. *A.M.*]

GENERAL ITEMS.

In answer to a Northern correspondent *re* rice bran as a food for stock, we are enabled to give an analysis of the bran, which we extract from the *Jamaica Agricultural Journal*:—

Analysis of a sample of Jamaica Rice Bran.

Moisture...	10·54
Oil	4·33
*Albuminous bodies	8·91
Carbohydrates, &c.	43·09
Woody fibre	20·50
†Ash	12·63
	100·00

This would form excellent ration for stock but for the large proportion of woody fibre, which is entirely indigestible. The proportion of protein (nitrogen) is fair, somewhat less than cornmeal, but only half what wheat bran contains. The fat or oil exists in better proportion to the protein and carbohydrates for our conditions than in corn or cornmeal Still, unless this rice bran could be sold at one-fourth the price of wheat bran, it could not in any way supersede it on account of the proportion of the indigestible fibre which is an objection to its constant use as a single ration. If mixed to the extent of one-third with some strong condensed food such as cotton-seed meal, and the bloodmeal used for poultry or beanmeal, it might form a cheap and suitable ration for cattle, pigs, or poultry.

The *Danish Milk Times* has the following:—The question has been asked, "Ought milking to be done in a quick or slow tempo? To answer this a series of trials have taken place in Germany, one of which we herewith publish. On the farm where the trials took place were the same lot of cows—five in number—alternately milked by an elderly woman, who milked very slowly, and by a very able young milkmaid, who finished her work in a very much shorter length of time. The following figures give the milk-yield from the same number of cows, milked at the same time of day, in pounds:—

No.	Slow Milking.	Quick Milking.
1 ...	32 ...	38¼
2 ...	34½ ...	51¼
3 ...	50 ...	68½
4 ...	40½ ...	43
5 ...	44½ ...	50

As an explanation of this enormous difference it is said that by the quick milking the milk-glands were influenced so as to give a larger quantity of milk.

MALARIA PREVENTED BY LIME.—The opportunities afforded Chief Wiley, of the Chemical Division, United States Department of Agriculture, have led him to the conclusion that the libera- application of lime to all centres of infection would prove of immense benefit, by promoting the vigorous development of nitrifying organisms, thus securing a rapid destruction of organic matter and the conversion of the nitrogenous par thereof into nitric acid or nitrates; and thus it i that lime may indirectly prove valuable in dis

* Contains nitrogen. † Including silica.

infecting and destroying the germs of malaria in general and yellow fever in particular. Briefly, it may be said, lime promotes vigorously the decay of organic matter, chiefly by furnishing a neutral or alkaline environment in which the nitrifying germs, which are most active in the destruction of organic matter, exercise their most important functions.

THE LEGEND OF THE ORANGE BLOSSOM.—The wearing of orange blossoms at weddings is accounted for in various ways. Among other stories is the following very pretty legend:—"An African king presented a Spanish king with a magnificent orange tree, whose creamy, waxy blossoms and wonderful fragrance excited the admiration of the whole court. Many begged in vain for a branch of the plant, and a foreign ambassador was tormented by the desire to introduce so great a curiosity to his native land. He used every possible means, fair or foul, to accomplish his purpose, but all his efforts coming to naught, he gave up in despair. The fair daughter of the Court gardener was loved by a young artisan, but lacked the dowry the family considered necessary in a bride. One day, chancing to break off a spray of orange blossoms, the gardener thoughtlessly gave it to his daughter. Seeing the coveted prize in the girl's hair, the wily ambassador offered her a sum sufficient for the disired dowry provided she gave him the branch and said nothing about it. Her marriage was soon celebrated, and on her way to the altar, in grateful remembrance of the source of all her happiness, she secretly broke off another bit of the lucky tree to adron her hair." Since the plant was first introduced into Europe it has been customary for a bride to wear a few sprays of the orange blossom in her hair or somewhere on her wedding dress.